Ontario

Environmental Technology Program Standard

The approved program standard for the Environmental Technology program of instruction leading to an Ontario College Advanced Diploma delivered by Ontario Colleges of Applied Arts and Technology (MCU funding code 62700).

Ministry of Colleges and Universities
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Contents

Introduction

This document is the Program Standard for the Environmental Technology program of instruction leading to an Ontario College Advanced Diploma delivered by Ontario Colleges of Applied Arts and Technology (MCU funding code 62700).

Development of system-wide program standards

In 1993, the Government of Ontario initiated program standards development with the objectives of bringing a greater degree of consistency to college programming offered across the province, broadening the focus of college programs to ensure graduates have the skills to be flexible and to continue to learn and adapt, and providing public accountability for the quality and relevance of college programs.

The Program Standards Unit of the Ministry of Colleges and Universities has responsibility for the development, review and approval of system-wide standards for programs of instruction at Ontario Colleges of Applied Arts and Technology.

Program standards

Program standards apply to all similar programs of instruction offered by Colleges of Applied Arts and Technology across the province of Ontario. Each program standard for a postsecondary program includes the following elements:

- **Vocational standard** (the vocationally specific learning outcomes which apply to the program of instruction in question),
- **Essential employability skills** (the essential employability skills learning outcomes which apply to all programs of instruction); and
- **General education requirement** (the requirement for general education in postsecondary programs of instruction).

Collectively, these elements outline the essential skills and knowledge that a student must reliably demonstrate in order to graduate from the program.

Individual Colleges of Applied Arts and Technology offering the program of instruction determine the specific program structure, delivery methods and other curriculum matters to be used in assisting students to achieve the outcomes articulated in the standard. Individual colleges also determine whether additional local learning outcomes will be required to reflect specific local needs and/or interests.

The expression of program standards as vocational learning outcomes

Vocational learning outcomes represent culminating demonstrations of learning and achievement. They are not simply a listing of discrete skills, nor broad statements of knowledge and comprehension. In addition, vocational learning outcomes are interrelated and cannot be viewed in isolation from one another. As such, they should be viewed as a comprehensive whole. They describe performances that demonstrate that significant integrated learning by graduates of the program has been achieved and verified.

Expressing standards as vocational learning outcomes ensures consistency in the outcomes for program graduates, while leaving to the discretion of individual colleges, curriculum matters such as the specific program structure and delivery methods.

The presentation of the vocational learning outcomes

The **vocational learning outcome** statements set out the culminating demonstration of learning and achievement that the student must reliably demonstrate before graduation.

The **elements of the performance** for each outcome define and clarify the level and quality of performance necessary to meet the requirements of the vocational learning outcome. However, it is the performance of the vocational learning outcome itself on which students are evaluated. The elements of performance are indicators of the means by which the student may proceed to satisfactory performance of the vocational learning outcome. The elements of performance do not stand alone but rather in reference to the vocational learning outcome of which they form a part.

The development of a program standard

In establishing the standards development initiative, the Government of Ontario determined that all postsecondary programs of instruction should include vocational skills coupled with a broader set of essential skills. This combination is considered critical to ensuring that college graduates have the skills required to be successful both upon graduation from the college program and throughout their working and personal lives.

A program standard is developed through a broad consultation process involving a range of stakeholders with a direct interest in the program area, including employers, professional associations, universities, secondary schools and program graduates working in the field, in addition to students, faculty and administrators at the colleges themselves. It represents a consensus of participating stakeholders on the essential learning that all program graduates should have achieved.

Updating the program standard

The Ministry of Colleges and Universities will undertake regular reviews of the vocational learning outcomes for this program to ensure that the Environmental Technology Program Standard remains appropriate and relevant to the needs of students and employers across the Province of Ontario. To confirm that this document is the most up-to-date release, please contact the Ministry of Colleges and Universities.

Vocational standard

All graduates of the Environmental Technology program have achieved the ten vocational learning outcomes (VLOs), in addition to achieving the essential employability outcomes and meeting the general education (GE) requirement.

Preamble

Environmental science is a rapidly evolving field, combining science, technology, and engineering which addresses several issues. These include climate change, air and water pollution, biodiversity loss, and resource depletion, to name a few. As the field of environmental science continues to evolve, so too must the education of the next generation of environmental technologists. Hence the relative urgency to update the current program standard for the Environmental Technologist Advanced Diploma program.

With the rapid change of the Ontario labour market, there is an increasing demand for environmental professionals, as businesses and governments recognize the importance of **sustainability** and environmental protection. In addition, the development of new technologies and the emergence of green jobs are creating new opportunities for environmental professionals. As a result, graduates of the Environmental Technology Ontario Advanced Diploma program should be prepared to enter a rapidly changing and competitive job market.

Graduates of the Environmental Technology Ontario Advanced Diploma Program must possess a range of skills and knowledge to be successful in the job market. These include knowledge of environmental regulations, environmental assessment and monitoring, **environmental management systems**, and environmental engineering. In addition, graduates should have strong communication and problem-solving skills, as well as the ability to work independently and in teams.

Graduates of the Environmental Technology Ontario Advanced Diploma Program can pursue a variety of job opportunities. These include, but are not limited to, positions in environmental consulting, environmental education, environmental engineering, environmental management, and environmental policy in government agencies, non-profit organizations, and in the private sector.

There may be opportunities for graduates to pursue further educational and occupational qualifications. Through articulation agreements between the colleges, universities or professional organizations, graduates may be granted credits towards a

degree and certification. Students should contact individual colleges for further details of a college's articulation agreements with other institutions or professional associations.

See Glossary

Note: The Ontario Council on Articulation and Transfer (ONCAT) maintains the provincial postsecondary credit transfer portal, ONTransfer.

Synopsis of the vocational learning outcomes
Environmental Technology (Ontario College Advanced Diploma)

The graduate has reliably demonstrated the ability to:

1. Collect representative environmental samples, perform routine and specialized tests, and interpret results while adhering to standard methods.

2. Monitor activities that are potentially harmful to the **environment** to develop and implement plans for their resolution.

3. Collect and analyze biophysical information, including habitat assessments, to suggest restoration opportunities.

4. Plan and engage in sustainable activities that promote stewardship of the environment by adhering to **Environmental Best Management Practices**.

5. Comply with applicable standards of professional conduct and principles of ethics in all aspects of one's work.

6. Adhere to occupational/environmental health and safety standards and applicable legislative requirements in all aspects of one's work.

7. Select established processes and protocols of **environmental management systems** for operational efficiency.

8. Participate in project planning, complete project tasks, and provide ongoing support for project management to ensure successful completion of project.

9. Document, maintain, and present technical information in various formats according to the purpose and audience.

10. Develop and implement strategies for ongoing personal and professional development to enhance performance as an environmental technologist.

See Glossary

Note: The learning outcomes have been numbered as a point of reference; numbering does not imply prioritization, sequencing, nor weighting of significance.

The vocational learning outcomes

1. The graduate has reliably demonstrated the ability to: collect representative environmental samples, perform routine and specialized tests, and interpret results while adhering to standard methods.

Elements of the performance

a. Select and perform specified sampling and/or analysis methods most appropriate for testing air, biota, soil, solids and water.
b. Design sampling regimes to meet stated objectives.
c. Carry out safe work practices.
d. Collect and process samples for laboratory analysis using the appropriate protocols and create new protocols as needed.
e. Conduct field tests and investigations according to prescribed procedures, processes and standards, to obtain data for use by environmental, engineering and scientific personnel.
f. Preserve, prepare, handle, store and ship samples for laboratory analysis.
g. Prepare solutions, culture media, equipment and instruments for analytical and experimental work.
h. Prepare, interpret and analyze data using appropriate methods.
i. Use and maintain automatic and manual sampling equipment efficiently and effectively.
j. Calibrate and troubleshoot sampling and analytical equipment.
k. Repair/maintain/design/fabricate specialized sampling equipment.
l. Follow appropriate **chain-of-custody** procedures.
m. Follow standard laboratory procedures, including wet-chemistry and instrumental analysis.
n. Maintain accurate documentation regarding sample collection and results of testing.
o. Apply safe and efficient procedures throughout, following accepted **Quality Assurance** (QA) and **Quality Control** (QC) principles.
p. Simulate environmental project data using standard industry computer-assisted models
q. Identify, select and use information management systems (e.g., spreadsheets, word-processing, Geographical Information System (GIS) software packages) and technology-based communication tools proficiently.
r. Search, collect and retrieve project-related information, using information technology tools competently.
s. Identify, select and use statistical software to organize, summarize and present environmental project-related data.

t. Collect, manage and present geographic information system data and other computer logged field data.
u. Identify, select and use computer-assisted surveying and mapping tools proficiently.
v. Develop computer skills and adapt to ever-changing software programs effectively.

See Glossary

2. The graduate has reliably demonstrated the ability to: monitor activities that are potentially harmful to the **environment** to develop and implement plans for their resolution.

Elements of the performance

a. Relate biological, chemical and physical sciences to environmental work.
b. Characterize **abiotic** and **biotic** relationships for the purpose of analyzing ecosystems.
c. Identify, select, perform and apply appropriate conversions between various units of measure.
d. Identify and use principles of pollutant-fate and pathways to identify potential areas of adverse impact in environmental work.
e. Relate knowledge of the biogeochemical cycles of various elements to environmental work.
f. Identify, select and use biological indicators to describe and assess environmental stressors.
g. Locate and use scientific guides, tables, handbooks, specifications, government publications and peer-reviewed scientific literature when conducting environmental work.
h. Use the scientific method effectively when conducting environmental work.
i. Relate scientific knowledge of geoscientific processes/principles to the transport of contaminants between environmental media, water, air and soil.

See Glossary

3. The graduate has reliably demonstrated the ability to: collect and analyze biophysical information, including habitat assessments, to suggest restoration opportunities.

Elements of the performance

a. Identify, select and use basic knowledge of unit operations, industrial processes as well as physical, biological and chemical controls when selecting and collecting air/water/soil and other environmental samples to environmental projects.
b. Apply principles of system instrumentation and monitoring to environmental projects.
c. Collect, manage, analyze and represent spatial information using **geomatics**, GIS and Global Position System (GPS).
d. Evaluate gaseous, liquid and solid waste management systems, as well as operation and control methods of related processes.
e. Evaluate water supply, treatment and distribution systems.
f. Evaluate wastewater collection and treatment, and biosolids handling systems.
g. Apply knowledge of flow measurement to air or water/wastewater systems.
h. Evaluate air emission control technologies.
i. Contribute to the analysis of the **environment** using basic knowledge of hydrologic, hydrogeologic, hydraulic and geotechnical principles to environmental processes.
j. Evaluate energy conservation measures, energy generation and alternative energy in terms of environmental impacts.
k. Recommend ways to reduce or eliminate environmental hazards, using sound scientific arguments.

See Glossary

4. The graduate has reliably demonstrated the ability to: plan and engage in sustainable activities that promote stewardship of the environment by adhering to **Environmental Best Management Practices**.

Elements of the performance

a. Evaluate the interrelationships among technology, politics, **Indigenous Ways of Knowing and Being**, social issues, the economy and an environmental project.
b. Evaluate contemporary theory and approaches to the management of physical, chemical, biological and geological natural resources.
c. Select, apply, evaluate and modify, as necessary, options consistent with environmental project outcomes.
d. Identify, select and use current ecosystem monitoring protocols.
e. Evaluate the impact of potential environmentally damaging activities (e.g., energy generation development, the mining and forestry industries) on ecosystems, renewable and non-renewable resources.
f. Identify the pressures and challenges of sustainable development.
g. Differentiate natural and **anthropogenic** influences on ecosystem stability and development.

See Glossary

5. The graduate has reliably demonstrated the ability to: comply with applicable standards of professional conduct and principles of ethics in all aspects of one's work.

Elements of the performance

a. Perform job related tasks in a manner consistent with the stated values of professional associations and other bodies related to the environmental field, [e.g., Ontario Association of Certified Engineering Technicians and Technologists (OACETT), Canadian Environmental Certification Approvals Board (CECAB)].
b. Recognize legal principles affecting projects and assessments.
c. Interpret and comply with project terms and guidelines.
d. Recognize the importance of local, national, and global environmental issues, organizations and Indigenous perspectives to **sustainability**.
e. Acknowledge individual and societal concerns or issues relevant to environmental related-projects.
f. Recognize the expectations and limitations of technology in solving environmental problems.
g. Consult with suitably qualified persons in areas where knowledge and experience are lacking.
h. Employ strategies to maintain currency and competency in knowledge and skills.
i. Practice ethical principles, including support for equity, diversity and inclusion in the workplace.
j. Assume responsibility and accountability for all data collected and analyzed.
k. Identify training courses, workshops and programs to enhance knowledge of legislation, standards, policies, procedures, codes, regulations and ethical principles as well as other professional topics.
l. Document all actions, observations, and measurements accurately and honestly.

See Glossary

6. The graduate has reliably demonstrated the ability to: adhere to occupational/environmental health and safety standards and applicable legislative requirements in all aspects of one's work.

Elements of the performance

a. Plan, coordinate, and carry out work duties placing the integrity of the natural environment (conserving, restoring and enhancing) and public safety above any commitment to private interests.
b. Interpret and apply safety codes, policies and practices, and accident prevention procedures.
c. Use protective equipment and wear appropriate clothing to ensure personal health and safety in the workplace.
d. Select the appropriate tools, and operate and maintain them safely.
e. Conduct safety inspections of various work environments to detect and correct hazardous conditions.
f. Act in accordance with legislation, codes and appropriate industry standards, including occupational health and safety and labour laws.
g. Use equipment and materials which adhere to relevant legislation, standards, codes and bylaws including environmental responsibilities.
h. Follow practices that comply with relevant legislation, standards, codes and bylaws, including environmental responsibilities.
i. Conduct safety inspections of various work environments to detect, report and correct hazardous conditions, where they may occur.
j. Handle, store and dispose of hazardous materials safely in accordance with the Workplace Hazardous Materials Information System (WHMIS).
k. Comply with relevant health and safety standards by identifying and reporting non-compliance issues.

See Glossary

7. The graduate has reliably demonstrated the ability to: select established processes and protocols of **environmental management systems** for operational efficiency.

Elements of the performance

a. Display knowledge of international **environmental management systems**, (e.g., ISO 14000 series).
b. Collect relevant data on the potential impact of an organization, a proposed facility, industrial development/closure, activity or policy on the **environment**.
c. Identify the purposes of and select from the various types of environmental audits.
d. Prepare for and participate in an environmental audit.
e. Identify legislation impacting the organization's activities.
f. Contribute input to possible solutions to reduce environmental impact of an activity or project.
g. Assist in the development of emergency response plans for accidental occurrences, including chemical spills that could pose a threat to human health and the **environment**.
h. Describe the role of environmental social governance and Indigenous perspectives on **environmental management systems** and implementation of sustainable practices.

See Glossary

8. The graduate has reliably demonstrated the ability to: participate in project planning, complete project tasks, and provide ongoing support for project management to ensure successful completion of project.

Elements of the performance

a. Plan, monitor and report on project-related issues including project progress
b. Carry out work duties while remaining cognizant of project costs and schedule
c. Acknowledge and account for the influence of behaviour, motivation and attitude on the completion of project-related tasks
d. Facilitate conflict remediation to resolve project-related problems and issues
e. Adhere to the principles of **Quality Assurance** (QA), **Quality Control** (QC) and **Environmental Best Management Practices** (EBMP).
f. Schedule and work effectively with consultants and sub-contractors within the parameters of all pertinent regulations.
g. Work independently and interdependently as is appropriate to the workplace context.
h. Carry out tasks effectively in a timely manner according to specified deadlines, balancing conflicting demands of high volume versus quality of results.

See Glossary

9. The graduate has reliably demonstrated the ability to: document, maintain, and present technical information in various formats according to the purpose and audience.

Elements of the performance

a. Synthesize relevant information in the preparation and presentation of project-related documents.
b. Interact with managers, co-workers and the public, demonstrating cognizance of cultural diversity and consideration of stakeholder sensibilities.
c. Select and use electronic communication tools effectively, efficiently and professionally.
d. Develop and use effective strategies to acquire information from stakeholders.
e. Present technical data in a fashion consistent with the expectations of project stakeholders and others, (e.g., communications media), and in compliance with organizational/industry standards, (i.e., using appropriate spreadsheets, graphics etc.).
f. Communicate effectively with associates by preparing correspondence, technical reports and proposals, using professional terminology and appropriate formats.
g. Participate in and chair meetings effectively, demonstrating knowledge of how to produce agendas, focus meeting tasks, record meeting information and prepare minutes.
h. Compile, review and consolidate documentation of field activities for further technical analysis.

See Glossary

10. The graduate has reliably demonstrated the ability to: develop and implement strategies for ongoing personal and professional development to enhance performance as an environmental technologist.

Elements of the performance

a. Reflect on one's own performance, identifying strengths and areas for improvement.
b. Solicit, from supervisors/mentors, areas of knowledge and practice needing further development.
c. Develop and implement a plan in consultation with supervisors/mentors to remedy identified gaps in knowledge and skills.
d. Develop and implement a plan to remain current in knowledge and practice related to focus of job responsibilities.
e. Identify the roles and benefits of professional organizations and certification [e.g., the Canadian Council of Technicians and Technologists (CCTT), ECO Canada, and the Ontario Association of Certified Engineering Technicians and Technologists (OACETT)].
f. Identify how to develop and begin developing a professional network and how to participate in environmental-based professional associations and activities.
g. Recognize the need for self-evaluation and the importance of lifelong learning.

See Glossary

Glossary

Abiotic: refers to non-living components of an environment. These components include physical and chemical factors such as temperature, light, water, soil, air, and minerals. Abiotic factors are essential for the survival of living organisms, as they provide the necessary resources for growth and development.

Anthropogenic: adjective; relating to or resulting from the influence of human beings on nature.

Biotic: refers to living or once-living organisms, such as plants, animals, fungi, and microorganisms, as well as the non-living components of their environment, such as soil, water, and air. It is the opposite of abiotic, which refers to non-living components of the environment.

Chain-of-Custody: is a term used to describe the chronological documentation or paper trail that records the sequence of custody, control, transfer, analysis, and disposition of a sample. It is used to maintain the integrity of the sample and to ensure that it is not compromised, tampered with, or contaminated. The chain of custody must be established and maintained from the time the sample is collected until it is presented as evidence.

Environment: means the components of the Earth and includes: (a) air, land and water; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d) any building, structure, machine or other device or thing made by humans; any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; and (e) the interacting natural systems that include components referred to in clauses (a) to (d). (Taken from the Ontario Environmental Protection Act, 1990)

Environmental Best Management Practices (EBMPs): are strategies and techniques used to reduce the environmental impact of activities and operations. EBMPs are designed to protect natural resources, reduce pollution, and conserve energy and water. They are often used in industries such as agriculture, manufacturing, and construction, as well as in government and private organizations. Examples of EBMPs include using renewable energy sources, reducing waste, and implementing water conservation measures.

Environmental Management System (EMS): is a set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency. It is a systematic approach to managing the environmental aspects of an organization’s operations, products, and services in order to meet its environmental objectives and comply with applicable environmental regulations. An EMS typically

includes policies, procedures, and processes for identifying, measuring, monitoring, and controlling environmental impacts, as well as for setting and achieving environmental objectives.

Geomatics: is the science of gathering, analyzing, and managing geographic data. It involves the use of geographic information systems (GIS), remote sensing, global positioning systems (GPS), and other technologies to collect, store, and analyze spatial data. Geomatics is used in a variety of fields, including urban planning, environmental management, and natural resource management.

Indigenous Ways of Knowing and Being: refer to the traditional knowledge, beliefs, and practices of Indigenous peoples that have been passed down through generations. These ways of knowing and being are based on a deep connection to the land, a respect for the environment, and a holistic view of the world. They include spiritual beliefs, cultural values, and traditional practices such as hunting, fishing, and gathering. Indigenous Ways of Knowing and Being are often characterized by a strong sense of community and a deep respect for environmental stewardship.

Quality Assurance (QA): is a process of ensuring that environmental standards are met in order to protect the environment and public health. It involves monitoring, testing, and evaluating environmental conditions to ensure that they meet established standards. QA also includes the implementation of corrective actions when necessary to ensure that environmental standards are maintained.

Quality Control (QC): is the process of monitoring and managing the quality of the environment to ensure that it is safe and healthy for human use. This includes monitoring air and water quality, controlling pollution, and managing waste. It also involves the implementation of regulations and policies to protect the environment from further degradation.

Sustainability: is the ability to maintain a certain level of economic, environmental, and social well-being over time. It is the practice of using resources in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability is a holistic approach to managing resources that considers the economic, environmental, and social impacts of decisions.

Essential employability skills

All graduates of the Environmental Technology program of instruction must have reliably demonstrated the essential employability skills learning outcomes listed below, in addition to achieving the vocational learning outcomes and meeting the general education requirement.

Context

Essential Employability Skills (EES) are skills that, regardless of a student's program or discipline, are critical for success in the workplace, in day-to-day living and for lifelong learning.

The teaching and attainment of these EES for students in, and graduates from, Ontario's Colleges of Applied Arts and Technology are anchored in a set of three fundamental assumptions:

- these skills are important for every adult to function successfully in society today
- our colleges are well equipped and well positioned to prepare graduates with these skills
- these skills are equally valuable for all graduates, regardless of the level of their credential, whether they pursue a career path, or they pursue further education

Skill categories

To capture these skills, the following six categories define the essential areas where graduates must demonstrate skills and knowledge.

- Communication
- Numeracy
- Critical Thinking & Problem Solving
- Information Management
- Interpersonal
- Personal

Application and implementation

In each of the six skill categories, there are a number of defining skills, or sub skills, identified to further articulate the requisite skills identified in the main skill categories. The following chart illustrates the relationship between the skill categories, the defining skills within the categories and learning outcomes to be achieved by graduates from all postsecondary programs of instruction that lead to an Ontario College credential.

EES may be embedded in General Education or vocational courses or developed through discrete courses. However, these skills are developed, all graduates with Ontario College credentials must be able to reliably demonstrate the essential skills required in each of the six categories.

Skill category: communication

Defining skills

Skill areas to be demonstrated by graduates:

- reading
- writing
- speaking
- listening
- presenting
- visual literacy

Learning outcomes

The graduate has reliably demonstrated the ability to:

1. communicate clearly, concisely and correctly in the written, spoken and visual form that fulfills the purpose and meets the needs of the audience.
2. respond to written, spoken or visual messages in a manner that ensures effective communication.

Skill category: numeracy

Defining skills

Skill areas to be demonstrated by graduates:

- understanding and applying mathematical concepts and reasoning
- analyzing and using numerical data
- conceptualizing

Learning outcomes

The graduate has reliably demonstrated the ability to:

1. execute mathematical operations accurately

Skill category: critical thinking and problem solving

Defining skills

Skill areas to be demonstrated by graduates:

- analyzing
- synthesizing
- evaluating
- decision making
- creative and innovative thinking

Learning outcomes

The graduate has reliably demonstrated the ability to:

1. apply a systematic approach to solve problems.
2. use a variety of thinking skills to anticipate and solve problems.

Skill category: information management

Defining skills

Skill areas to be demonstrated by graduates:

- Gathering and managing information
- Selecting and using appropriate tools and technology for a task or a project
- Computer literacy
- Internet skills

Learning outcomes

The graduate has reliably demonstrated the ability to:

1. locate, select, organize and document information using appropriate technology and information systems.
2. analyze, evaluate and apply relevant information from a variety of sources.

Skill category: interpersonal

Defining skills

Skill areas to be demonstrated by graduates:

- Teamwork
- Relationship management
- Conflict resolution
- Leadership
- Networking

Learning outcomes

The graduate has reliably demonstrated the ability to:

1. show respect for the diverse opinions, values, belief systems and contributions of others.
2. interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.

Skill category: personal

Defining skills

Skill areas to be demonstrated by graduates:

- Managing self
- Managing change and being flexible and adaptable
- Engaging in reflective practices
- Demonstrating personal responsibility

Learning outcomes

The graduate has reliably demonstrated the ability to:

1. manage the use of time and other resources to complete projects.
2. take responsibility for one's own actions, decisions and their consequences.

General education requirement

All graduates of the Environmental Technology program must have met the general education requirement described below, in addition to achieving the vocational and essential employability skills learning outcomes.

Requirement

The General Education Requirement for programs of instruction is stipulated in the Credentials Framework in the Minister's Binding Policy Directive Framework for Programs of Instruction.

In programs of instruction leading to either an Ontario College Diploma or an Ontario College Advanced Diploma, it is required that graduates have been engaged in learning that exposes them to at least one discipline outside their main field of study and increases their awareness of the society and culture in which they live and work. This will typically be accomplished by students taking 3 to 5 courses (or the equivalent) designed discretely and separately from vocational learning opportunities.

This general education learning would normally be delivered using a combination of required and elective processes.

Purpose

The purpose of General Education in the Ontario college system is to contribute to the development of citizens who are conscious of the diversity, complexity and richness of the human experience; who are able to establish meaning through this consciousness; and who, as a result, are able to contribute thoughtfully, creatively and positively to the society in which they live and work.

General Education strengthens students' essential employability skills, such as critical analysis, problem solving and communication, in the context of an exploration of topics with broad-based personal and/or societal importance.

Themes

The themes listed below will be used to provide direction to Ontario Colleges in the development and identification of courses that are designed to fulfil the General Education Requirement for programs of instructions.

Each theme provides a statement of Rationale and offers suggestions related to more specific topic areas that could be explored within each area. These suggestions are neither prescriptive nor exhaustive. They are included to provide guidance regarding the

nature and scope of content that would be judged as meeting the intent and overall goals of General Education.

Arts in society:

Rationale:

The capacity of a person to recognize and evaluate artistic and creative achievements is useful in many aspects of his/her life. Since artistic expression is a fundamentally human activity, which both reflects and anticipates developments in the larger culture, its study will enhance the student's cultural and self-awareness.

Content:

Courses in this area should provide students with an understanding of the importance of visual and creative arts in human affairs, of the artist's and writer's perceptions of the world and the means by which those perceptions are translated into the language of literature and artistic expression. They will also provide an appreciation of the aesthetic values used in examining works of art and possibly, a direct experience in expressing perceptions in an artistic medium.

Civic Life:

Rationale:

In order for individuals to live responsibly and to reach their potential as individuals and as citizens of society, they need to understand the patterns of human relationships that underlie the orderly interactions of a society's various structural units. Informed people will have knowledge of the meaning of civic life in relation to diverse communities at the local, national and global level and an awareness of international issues and the effects of these on Canada, as well as Canada's place in the international community.

Content:

Courses in this area should provide students with an understanding of the meaning of freedoms, rights and participation in community and public life, in addition to a working knowledge of the structure and function of various levels of government (municipal, provincial, national) in a Canadian and/or in an international context. They may also provide an historical understanding of major political issues affecting relations between the various levels of government in Canada and their constituents.

Social and cultural understanding:

Rationale:

Knowledge of the patterns and precedents of the past provide the means for a person to gain an awareness of his or her place in contemporary culture and society. In addition to this awareness, students will acquire a sense of the main currents of their culture and that of other cultures over an extended period of time in order to link personal history to the broader study of culture.

Content:

Courses in this area are those that deal broadly with major social and cultural themes. These courses may also stress the nature and validity of historical evidence and the variety of historical interpretation of events. Courses will provide the students with a view and understanding of the impact of cultural, social, ethnic or linguistic characteristics.

Personal understanding:

Rationale:

Educated people are equipped for life-long understanding and development of themselves as integrated physiological and psychological entities. They are aware of the ideal need to be fully functioning persons: mentally, physically, emotionally, socially, spiritually and vocationally.

Content:

Courses in this area will focus on understanding the individual: his or her evolution; situation; relationship with others; place in the environment and universe; achievements and problems; and his or her meaning and purpose. They will also allow students the opportunity to study institutionalized human social behaviour in a systematic way. Courses fulfilling this requirement may be oriented to the study of the individual within a variety of contexts.

Science and technology:

Rationale:

Matter and energy are universal concepts in science, forming a basis for understanding the interactions that occur in living and non-living systems in our universe. Study in this area provides an understanding of the behaviour of matter that provides a foundation for further scientific study and the creation of broader understanding about natural phenomena.

Similarly, the various applications and developments in the area of technology have an increasing impact on all aspects of human endeavour and have numerous social, economic and philosophical implications. For example, the operation of computers to process data at high speed has invoked an interaction between machines and the human mind that is unique in human history. This and other technological developments have a powerful impact on how we deal with many of the complex questions in our society.

Content:

Courses in this area should stress scientific inquiry and deal with basic or fundamental questions of science rather than applied ones. They may be formulated from traditional basic courses in such areas of study as biology, chemistry, physics, astronomy, geology or agriculture. As well, courses related to understanding the role and functions of computers (e.g., data management and information processing) and assorted computer-related technologies should be offered in a non-applied manner to provide students with an opportunity to explore the impact of these concepts and practices on their lives.

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