



# Computer Science and Mathematics (200.C0)

Pre-University Program

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College Education

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Ministère de l'Éducation et de l'Enseignement supérieur.

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## History of the Program of Study

Fall 2008	Initial authorization of the experimental program (v. 2008).
January 2009	Update of the special conditions for admission. Replacement of the conditions “Mathematics 536,” “Physics 534” and “Chemistry 534” by “Secondary V Chemistry,” “Secondary V Mathematics: Technical and Scientific option or Science option” and “Secondary V Physics.”
June 2010	Minor modification of objectives 020W, 020X, 020Y and 020Z.
July 2011	Minor modification of objective 020V.
November 2012	Extension of the experimental program of study to the end of the 2017-2018 school year.
March 2018	Extension of the experimental program of study to the end of the 2022-2023 school year.
Fall 2019	End of the experimental program and start of the official program of study.

## DEFINITION OF THE PROGRAM

<b>Program title</b>	:	Computer Science and Mathematics
<b>Type of program</b>	:	Pre-university program
<b>Program code and version</b>	:	200.C0 (2019)
<b>Type of certification</b>	:	Diploma of College Studies
<b>Special conditions for admission</b>	:	Secondary V Chemistry Secondary V Mathematics: Technical and Scientific option or Science option Secondary V Physics
<b>Number of credits</b>	:	58 $\frac{2}{3}$
— General education component:		26 $\frac{2}{3}$
— Program-specific component :		32
<b>Number of periods of instruction</b>	:	1560
— General education component:		660
— Program-specific component :		900
<b>Field of study</b>	:	Computer Science, Mathematics and Science
<b>Disciplines</b>	:	Chemistry, Computer science, Mathematics, Physics
<b>Term and year of effect</b>	:	Fall 2019

## Décision relative à l'approbation d'un programme d'études préuniversitaires

### IDENTIFICATION DU PROGRAMME D'ÉTUDES

<b>Titre du programme</b>	Sciences informatiques et mathématiques
<b>Type de programme</b>	Programme d'études préuniversitaires
<b>Code et version du programme</b>	200.C0 (2019)
<b>Type de sanction</b>	Diplôme d'études collégiales
<b>Conditions particulières d'admission</b>	Chimie de la 5 <sup>e</sup> secondaire Mathématique, séquence Technico-sciences ou séquence Sciences naturelles de la 5 <sup>e</sup> secondaire Physique de la 5 <sup>e</sup> secondaire
<b>Nombre d'unités</b>	58 ½
— Formation générale	26 ½
— Formation spécifique	32
<b>Nombre de périodes d'enseignement</b>	1 560
— Formation générale	660
— Formation spécifique	900
<b>Champs d'études</b>	Informatique, mathématique, sciences
<b>Disciplines</b>	Chimie, informatique, mathématique, physique
<b>Session et année d'entrée en vigueur</b>	Automne 2019

### APPROBATION

Recommandations :

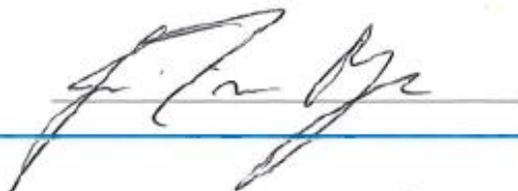
  
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Sous-ministre adjoint  
Enseignement supérieur

26 juillet 2019  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Sous-ministre *par*  
*interim*

\_\_\_\_\_  
Date

Approbation du ministre :

  
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26 août 2019  
\_\_\_\_\_  
Date



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## College-Level Programs

In Québec, college is the next stage after the compulsory years of schooling (elementary and secondary school). College graduates enter the labour market directly or proceed to university studies. The Minister of Education, Recreation and Sports establishes the programs of study, while individual colleges ensure their implementation.

A college-level program provides the frame of reference within which the students acquire designated competencies in order to qualify for a profession or to pursue their studies. For the teachers, the program outlines learning objectives and defines the scope of their application.

The following figure illustrates the relationships among the elements of a college-level program, going from the general to the specific:

- Aims of college education
- Common competencies
- Goals of the program-specific component and the general education component
- Objectives and standards of the program-specific component and the general education component

Figure 1 – Elements of a College-Level Program



Programs leading to the Diploma of College Studies (DCS) include two main components: a general education component and a program-specific component. Both these components contribute to a student's education, as the knowledge, skills and attitudes imparted in one are emphasized and applied in the other, whenever possible. General education is an integral part of each program and, when coupled with the program-specific component as part of an integrated approach, fosters the development of the competencies required by all programs.

All college-level programs are characterized by three educational aims and five common competencies.

## Aims of College Education

Educational aims guide the actions of those involved in the students' education. They facilitate the program-based approach by establishing the outcomes expected of students at the end of their college studies.

### To educate students to live responsibly in society

At the personal level, students show they are engaged in their learning. They demonstrate rigour and perseverance as well as skills enabling them to analyze, synthesize and carry out research. At the professional level, they draw on their ability to apply their knowledge, skills and attitudes and to adapt to new situations. In the realm of social and civic life, students assume their role as informed and responsible citizens by adopting desirable attitudes and behaviours. They show evidence of open-mindedness and a sense of community in their dealings with others.

### To help students integrate cultural knowledge into their studies

Students continue to enhance their personal culture and are able to appreciate various forms of cultural expression. Through their studies, they have become familiar with cultural productions. They can interpret the meaning and assess the value of these productions and are aware of the role they themselves play in the expression of culture. The development of their critical judgment and social conscience and the consolidation of their historical references have broadened their cultural horizons. Students recognize the diversity of social and cultural realities and appreciate the breadth and wealth of Québec's culture. Lastly, they apply their cultural knowledge by making connections among events occurring around them and by being involved in cultural, artistic, sports, technical or scientific activities.

### To help students master language as a tool for thought, communication and openness to the world

Students understand and produce various forms of complex discourse in different situations. They are able to read and write independently at an advanced skill level. Their mastery of language allows them to engage in independent reflection, to know where they stand relative to various forms of discourse, and to express themselves in a structured, rational and precise manner. When faced with different communication situations, students are able to express their world view and identity. Language mastery also helps students be receptive to the dissemination of a broad range of knowledge. It allows them to share points of view and improve their communication skills in both the language of instruction and a second language.

## Common Competencies of College Education

Common competencies are associated with the aims of college education. They help to ensure students are adequately prepared for personal and professional life.

### Solve problems

Students can identify a problem and analyze its elements. They can list and classify possible solutions and implement the one they feel is most effective. They reflect on their approach, assess the appropriateness of the chosen solution and determine whether it can be applied in other situations.

### Use creativity

Students discover new possibilities by juxtaposing, combining and reorganizing existing concepts, and by using ideas, strategies and techniques in new ways. Students are open to new ideas and different ways of doing things, while assessing their effectiveness.

### Adapt to new situations

When faced with a new situation, students are both open and critical. After analyzing the situation at hand, they identify and test ways of dealing with it. To adapt to a world that is constantly changing, students work in teams and show concern for keeping their knowledge up to date.

### Exercise a sense of responsibility

Students assume their role as responsible citizens and act in accordance with socially and democratically desirable attitudes and behaviours. They act ethically and with integrity, exercise critical judgment and are fully engaged, personally, socially and professionally. Independent and organized, they respect their commitments.

### Communicate

Students deliver a coherent message adapted to each situation. They are able to listen and to structure their thoughts in order to formulate a clear message. They rely on a variety of communication strategies and use information and communications technologies. They evaluate the impact of their communication and review their strategies, as needed.

## Implementation of College-Level Programs

Each college determines the ways in which the educational aims, common competencies, goals, objectives and standards are implemented. This does not mean that students in a college must follow common courses. Each course may contribute to the full or partial achievement of these elements. The important thing is that all of these elements are taken into consideration in one or more courses and that they become specific focuses of teaching and learning, since they have been recognized as essential to the practice of a profession or to the pursuit of university studies in a given discipline.

## The *Computer Science and Mathematics* Program

The *Computer Science and Mathematics* program was designed in keeping with the *Cadre général d'élaboration des programmes d'études préuniversitaires*, the framework for the development of pre-university programs, whose aim is to:

- Harmonize the general education and program-specific components of programs (program-based approach)
- Harmonize pre-university programs with university programs (training continuum)
- Foster the acquisition of comparable competencies throughout the college network
- Foster a type of education that contributes to the overall development of the person

This document was developed in cooperation with a program advisory committee composed of university representatives, academic deans and college teachers.

The *Computer Science and Mathematics* program includes four components: a program-specific component, a general education component that is common to all programs, a general education component that is specific to each program, and a general education component that complements the program.

- The program-specific component consists of 32 credits.
- The general education component that is common to all programs consists of  $16\frac{2}{3}$  credits:
  - Language of Instruction and Literature:  $7\frac{1}{3}$  credits
  - Philosophy or Humanities:  $4\frac{1}{3}$  credits
  - Physical Education: 3 credits
  - Second Language: 2 credits
- The general education component that is specific to the program consists of 6 credits:
  - Language of Instruction and Literature: 2 credits
  - Philosophy or Humanities: 2 credits
  - Second Language: 2 credits
- The complementary general education component, which aims to expose students to subject areas outside their program of study, consists of 4 credits and includes courses in the following areas:
  - Social Sciences
  - Science and Technology
  - Modern Language
  - Mathematics Literacy and Computer Science
  - Art and Aesthetics
  - Contemporary Issues

Students may choose courses only in those areas that are outside their program of study.

## Aim of the Program

The *Computer Science and Mathematics* program is intended to give students a balanced education that integrates the basic components of a rigorous scientific education in physics, chemistry, mathematics and computer science as well as in general education, thus preparing students for university programs in computer science, mathematics, engineering and most of the pure sciences programs.

## Goals of the Program

### Program-Specific Component

At the end of the *Computer Science and Mathematics* program, students will be able to:

- Situate and connect the characteristics of the subjects studied
- Assimilate concepts and work methods required to study subjects in various fields of knowledge
- Use information and communications technologies (ICT) to solve problems in a scientific context
- Communicate clearly and correctly
- Take charge of their own personal and social development
- Work as a member of a team

### Situate and connect the characteristics of the subjects studied

As they construct the scientific knowledge which is the focus of the program's courses in computer science, mathematics and science, students must not only know but also be able to do the following:

- establish links among the theories, approaches and methodologies specific to the various subjects in science and technology by situating them in the context of an evolving society;
- understand the scope and limits of the scientific approach as a way of constructing knowledge;
- recognize the contributions of science, mathematics and technology to the development of society.

Science differs from other ways of understanding reality due as much to its first objective, which is to understand the world we live in, as to its ways of knowing, which are primarily through observation, reasoning, experimentation and validation. The ways of constructing and transforming knowledge are thus presented for discussion and validation in the form of research hypotheses. A scientific result may suggest a desirable change that could be made to the physical or social environment, or even to the sphere of human activity. We are therefore placed before a challenge that we can overcome with the help of technology.

In each course of the program, the choice of learning activities must reflect a constant concern for opening the way to other fields of knowledge. General education courses can also make a contribution, particularly by the choice of subjects or texts to be covered in the general education courses specific to the program.

### Integrate concepts and work methods required to study subjects in the various fields of knowledge

Integration must take place in the context of analysis, research, creation, discussion, verification, criticism and stocktaking with respect to the works, phenomena and problems dealt with in the program. All of the courses must focus on this goal, to enable students to do the following:

- discuss questions and themes spanning several subjects;
- analyze and criticize texts, theses, solutions and theories;
- reason logically;
- apply the scientific method;

- take a systematic approach to problem solving;
- analyze phenomena using approaches from different disciplines;
- represent, conduct research and carry out projects pertaining to situations, problems or issues by drawing on several fields of knowledge.

Using the knowledge they have acquired in the particular field of study of the program, students must be able to carry out the various steps in the scientific method, both experimental and comparative. At the college level, they are not asked to be scientists or to produce new findings but, more realistically, to confirm previously established results or to verify propositions. To this end, they must observe, gather data, draw inferences based on data, formulate hypotheses, set up experiments, use measuring instruments correctly and carry out experiments, summarize their observations, estimate their degree of uncertainty, draw conclusions from them and interpret and critique them.

In the general meaning of the term, that is, in a context much broader than that of exercises designed to teach students to use techniques or apply algorithms, students must be able to frame a problem and construct a representation of it, analyze a problem, identifying its elements and the relationships among them and their structure and organization, and solve a problem.

### Use information and communications technologies (ICT) to solve problems in a scientific context

The students must acquire the ability to choose and use the technological resources placed at their disposal, namely:

- use a computer and its main peripherals and networks for purposes of gathering data, for documentation and for communication;
- use the main types of data-processing software: e.g. word-processing, data-processing and graphics programs, specialized software;
- develop computer-based solutions to solve scientific problems.

It is essential that the different courses take this goal into account, even if students are already enrolled in specialized computer training. Students may be introduced to the use of data-processing programs in science. Educational software may also be used to allow the students to acquire and develop problem-solving skills or to familiarize them with simulations and modelling, which constitute powerful computer applications in science and mathematics.

In addition, it is important that students, especially those who will later study applied sciences or engineering, receive an introduction to the development of algorithms and the use of a programming language.

### Communicate clearly and correctly

Mastery of written and spoken language is essential for the clear expression of ideas. With respect to second language studies, the emphasis will be on the development of reading skills. All the courses in the program must contribute to the development of the following abilities:

- to read scientific or literary texts, as well as texts on current events;
- to present an argument, analysis, commentary, process or result in the appropriate form;
- to draft literary, scientific or other types of texts;
- to express themselves effectively in presentations or discussions in small or large groups.

Students must perform these tasks by correctly using the language of instruction and the second language. The requirements in the latter case should be realistic, with learning activities focused mainly on reading, making proper use of the various languages (terminology, symbolism, conventions, etc.) specific to the scientific disciplines covered in the program.

### Take charge of their own personal and social development

Aside from strictly academic learning, the program must provide students with concrete opportunities to participate in their own education and to become personally involved in their development. Throughout their studies, they must do the following:

- express their interest in culture, science, mathematics and computer science;
- be concerned with the ethical impact of science and technology on individuals and societies;
- make physical activity a part of their lifestyle in order to stay healthy;
- demonstrate autonomy and a commitment to the successful pursuit of university studies;
- use intellectual work methods and study techniques.

To ensure that students master the work methods required to pursue university studies, the program must focus explicitly on the development of a certain number of practical skills. The work methods used must contribute to the integration of the various fields of knowledge and to the establishment of links among them. For these reasons, students must learn to manage their time, develop good note-taking habits, apply effective reading techniques, apply summarizing techniques, carry out documentary research and adopt good science- or computer-lab-work practices.

To take up the challenges facing science students at the university level, college students also need to become independent learners by locating, organizing and using pertinent information, by planning their own learning process, setting realistic goals and choosing appropriate means of attaining them, by evaluating the effectiveness of their strategies, adapting to different situations and readjusting their objectives and behaviour.

### Work as members of a team

College and university students are not isolated. They are surrounded by professors, students, technicians and many others, not to mention the scientific community that they will gradually become part of over the years.

Students must learn to work effectively with others, while improving the quality of their interactions with their peers and establishing true cooperation based on confidence, motivation, responsiveness and team spirit. More specifically, they will do the following:

- assume various roles (leadership, collaboration, support) in disciplinary and multidisciplinary teams oriented toward the pursuit of specific goals and common objectives;
- understand and respect the diversity and interdependence of individual team members.

Whereas in the past teams were more homogenous, the modern trend is for team members to have different abilities and skills in order to improve their effectiveness at problem-solving. The composition of the team may be permanent, occasional, temporary or even virtual. The use of teamwork aims to promote knowledge networking by relying on members with diverse interests and abilities.

## General Education Component Common to All Programs and General Education Component Specific to the Program

The general education components that are common to all programs and specific to the program contribute to the development of twelve competencies associated with the three aims of college education:

- for the aim *To educate students to live responsibly in society:*
  - Demonstrate independence and creativity in thought and action
  - Demonstrate rational, critical and ethical thinking
  - Develop strategies that promote reflection on their knowledge and actions
  - Pursue the development of a healthy and active lifestyle
  - Assume their social responsibilities
  
- for the aim *To help students integrate cultural knowledge into their studies:*
  - Recognize the influence of culture and lifestyle on the practice of physical activity and sports
  - Recognize the influence of the media, sciences or technology on culture and lifestyle
  - Analyse works in philosophy or the humanities emanating from different historical periods and movements
  - Appreciate literary and non-literary works of other artistic expressions emanating from different historical periods and movements
  
- for the aim *To help students master language as a tool for thought, communication and openness to the world:*
  - Improve communication in the second language
  - Master the basic rules of discourse and argumentation
  - Refine oral and written communication in the language of instruction

### English, Language of Instruction and Literature

Students who have achieved the general education objectives in English, Language of Instruction and Literature,

- will be able to demonstrate their knowledge of the following:
  - the basic vocabulary and terminology used when discussing literary works
  - ways to apply an independent analytical approach to literary genres
  - ways to apply an independent analytical approach to literary themes
  - the appreciation of literary and non-literary works or other artistic expressions of different historical periods and movements
  - ways to identify the socio-cultural and historical context of different periods and movements
  - ways to refine oral and written communication in the language of instruction
  
- will be able to demonstrate their ability to do the following:
  - read, write, listen and speak at a college level of proficiency
  - develop their own ideas in arguments and theses
  - organize their arguments and theses in a discourse and edit their work
  - produce and analyze various styles of discourse
  - communicate in the styles of discourse appropriate to one or more fields of study

- will be encouraged to develop the following attitudes:
  - independence, individuality, and open-mindedness in thought and action
  - an appreciation of literature and other artistic works from different periods
  - a recognition of the role of media within a society and its culture
  - an awareness of strategies that foster self-reflective practice in their learning and actions
  - critical and ethical thought

## Humanities

Humanities constitutes a thematic, multidisciplinary and, at times, transdisciplinary exploration of humankind, including its accomplishments, failures, abilities, creations, ideas and values. Students who have achieved the general education objectives in humanities

- will be able to demonstrate their knowledge of the following:
  - the main concepts, limits and uses of a form of knowledge including significant historical reference points
  - the main concepts, limits and uses of a world view
  - the nature and organization of the basic elements of an ethical question
  - methods for coherent integration of concepts and the formulation and synthesis of ideas
  - the importance and practice of adequately substantiated argumentation, written and oral
- will be able to demonstrate their ability to do the following:
  - describe, explain and organize the main elements, ideas, values and implications of a world view in a coherent fashion
  - compare world views
  - recognize the basic elements in a specific example of the organization, transmission, and use of knowledge
  - recognize forms of creativity and original thought
  - define the dimensions, limits and uses of knowledge in appropriate historical contexts
  - identify, organize and synthesize the salient elements of a particular example of knowledge
  - situate important ethical and social issues in their appropriate historical and intellectual contexts
  - explain, analyze and debate ethical issues in a personal and professional context
  - utilize the multiple strategies of critical thinking
- will be encouraged to develop the following attitudes:
  - openness to diversity and pluralism
  - awareness of the limits of knowledge claims, world views and ethical perspectives
  - respect for the points of view of others
  - empathy and acceptance of others
  - concern for global issues
  - determination to continue learning

## French as a Second Language

Students who have achieved the general education objectives in French as a Second Language

- will be able to demonstrate their knowledge of the following:
  - different reading techniques
  - the formal elements needed to produce a structured text, both orally and in writing
  - different forms of discourse and their specific uses
- will be able to demonstrate their ability to do the following:
  - question, analyze, judge and defend an argument in French
  - reflect on their knowledge and actions notably by revising their written productions
  - maintain social relationships and share in the cultural life of Québec
  - establish and maintain work-related relationships in French
- will be encouraged to develop: the following attitudes of:
  - openness to the various aspects of Québec culture
  - recognition and promotion of creativity
  - readiness to participate in social and economic life

## Physical Education

Students who have achieved the general education objectives in physical education

- will be able to demonstrate their knowledge of the following:
  - notions and concepts based on the findings of scientific research and how to apply them methodically to physical or sporting activities
  - the relationship between lifestyle, physical activity, physical fitness and health
  - ways to evaluate their own abilities and needs with respect to activities that can enhance their health and fitness
  - the rules, techniques and conditions involved in different types of physical or sporting activity
  - the main socio-cultural determinants of physical activity and a healthy lifestyle
- will be able to demonstrate their ability to do the following:
  - give an initial account of their abilities, attitudes and needs
  - choose physical activities on the basis of their motivation, their ability to adapt to effort and their need for change
  - apply the rules and techniques of a certain number of physical activities with a view to practising them sufficiently on a regular basis
  - set goals that are realistic, measurable, challenging and situated within a specific time frame
  - improve their mastery of basic techniques and strategies associated with physical activities
  - evaluate their skills, attitudes and progress in order to adapt their means or objectives in their practice of physical activities
  - autonomously maintain or increase their physical activity and fitness levels in order to develop a healthy and active lifestyle
  - use their creativity in physical activities
  - express their choice of activities in a clear and reasoned manner

- will be encouraged to develop the following attitudes:
  - awareness of the importance of regular and sufficient physical activity in order to improve their fitness
  - awareness of the factors that encourage them to practise physical activity more often
  - awareness of the importance of evaluating and respecting their ability to adapt to effort, as well as an awareness of the conditions necessary to carry out a physical activity program, before committing to it
  - self-confidence, self-control, cooperation, respect and understanding, through knowledge and through the practice of a physical activity
  - respect for ethical behaviour when participating in a sport or a physical activity
  - respect for individual and cultural differences as well as for the environment in which the sport or physical activity takes place
  - appreciation for the aesthetic value of physical activity as well as the opportunities for enjoyment it provides
  - readiness to adopt the values of discipline, effort, consistency and perseverance
  - readiness to promote, as a social value, the regular and sufficient practice of physical activity

## Complementary General Education Component

### Social Sciences

The goal of this subject area is to help students view the social sciences as a specific approach to the study of human existence. This goal may cover various aspects, including the study of the specific contribution of the social sciences to an understanding of contemporary issues and the application of approaches from the social sciences.

### Science and Technology

The goal of this subject area is to present science and technology as a specific approach to the study of reality, by introducing students to this area of knowledge. This goal may cover various aspects, including the study of the general nature of science and technology and contemporary scientific or technological issues as well as the application of the scientific method.

### Modern Language

The goal of this subject area is to introduce students to the basic structures and vocabulary of a third language and help them develop an awareness of the culture of its native speakers.

### Mathematics Literacy and Computer Science

The goal of this subject area is to highlight a culture of mathematics and computer science. This goal may cover various aspects, including the study of the role of mathematics or computers in contemporary society as well as the use of mathematical or computer concepts, procedures and tools.

### Art and Aesthetics

The goal of this subject area is to provide students with a cultural awareness by exploring various forms of art and to help students develop an aesthetic awareness. This goal may cover various aspects, including an appreciation of different art forms and the production of a work of art.

## Contemporary Issues

This subject area focuses on current, transdisciplinary issues. The concept of transdisciplinarity refers to a type of approach that addresses a contemporary issue from the perspective of different disciplines and areas of knowledge, beyond a mere juxtaposition of the subjects studied.

## Program Objectives and Standards

### List of Objectives

#### Program-Specific Component

32 credits, 900 periods of instruction

#### Objectives Common to the *Science (200.B0)* Program

- 00UL Analyze chemical and physical changes in matter using concepts associated with the structure of atoms and molecules
- 00UN Apply the methods of differential calculus to the study of functions and problem solving
- 00UP Apply the methods of integral calculus to the study of functions and problem solving
- 00UQ Apply the methods of linear algebra and vector geometry to problem solving
- 00UR Analyze various situations and phenomena in physics using the basic principles of classical mechanics
- 00US Analyze various situations and phenomena in physics using the basic laws of electricity and magnetism
- 00UT Analyze various situations or phenomena associated with waves, optics and modern physics using basic principles

#### Objectives of the *Computer Science and Mathematics (200.C0)* Program

- 020V Apply basic concepts in discrete mathematics to problem solving
- 020W Develop programs to solve simple problems
- 020X Organize and manipulate data
- 020Y Design and develop programs in a graphic environment
- 020Z Demonstrate their integration of the learning in the *Computer Science and Mathematics* program

#### General Education Component Common to All Programs and General Education Component Specific to the Program

16 $\frac{2}{3}$  credits and 420 periods of instruction, 6 credits and 150 periods of instruction

#### English, Language of Instruction and Literature

- 4EA0 Analyze and produce various forms of discourse
- 4EA1 Apply an analytical approach to literary genres
- 4EA2 Apply an analytical approach to a literary theme
- 4EAP Communicate in the forms of discourse appropriate to one or more fields of study

#### Humanities

- 4HU0 Apply a logical analytical process to how knowledge is organized and used
- 4HU1 Apply a critical thought process to world views
- 4HUP Apply a critical thought process to ethical issues relevant to the field of study

#### French as a Second Language

One objective to be met from the following:

- 4SF0 Apply basic concepts for communicating in standard French
- 4SF1 Communicate in standard French with some ease
- 4SF2 Communicate with ease in standard French
- 4SF3 Explore a cultural and literary topic

One objective to be met from the following:

- 4SFP Apply basic concepts for communicating in French in relation to the student's field of study
- 4SFQ Communicate in French on topics related to the student's field of study
- 4SFR Communicate with ease in French on topics related to the student's field of study
- 4SFS Produce a text in French on a topic related to the student's field of study

### Physical Education

4EP0 Analyze one's physical activity from the standpoint of a healthy lifestyle

4EP1 Improve one's effectiveness when practising a physical activity

4EP2 Demonstrate one's ability to assume responsibility for maintaining a healthy lifestyle through the continued practice of physical activity

### Complementary General Education Component

4 credits, 90 periods of instruction

Two objectives to be met from the following, in subject areas outside the student's program of study:

- 000V Estimate the contribution of the social sciences to an understanding of contemporary issues
- 000W Analyze one of the major problems of our time using one or more social scientific approaches
- 000X Explain the general nature of science and technology and some of the major contemporary scientific or technological issues
- 000Y Resolve a simple problem by applying the basic scientific method
- 000Z Communicate with limited skill in a modern language
- 0010 Communicate on familiar topics in a modern language
- 0067 Communicate with relative ease in a modern language
- 0011 Recognize the role of mathematics or computer science in contemporary society
- 0012 Use various mathematical or computer science concepts, procedures and tools for common tasks
- 0013 Consider various forms of art produced according to aesthetic practices
- 0014 Produce a work of art
- 021L Consider contemporary issues from a transdisciplinary perspective
- 021M Explore a contemporary issue from a transdisciplinary perspective

## Program-Specific Component

### Objectives and Standards Common to the *Science* (200.B0) Program

Code: 00UL

#### Objective

#### Standard

##### Statement of the Competency

Analyze chemical and physical changes in matter using concepts associated with the structure of atoms and molecules.

##### Elements of the Competency

1. Apply the probabilistic model of the atom in analyzing the properties of the elements.
2. Solve problems pertaining to the structure and states of matter using modern theories of chemistry.
3. Apply the laws of stoichiometry to the study of chemical phenomena.
4. Verify experimentally a number of physical and chemical properties of matter.

##### Performance Criteria

- Proper use of concepts, laws and principles
- Use of appropriate terminology
- Representation in conformity with the probabilistic model
- Adequate representation of situations presented
- Correct application of experimental procedures and techniques
- Adherence to safety and environmental protection regulations
- Accuracy of calculations
- Laboratory report in line with established standards

##### Learning Activities

Discipline: Chemistry

Weighting: 3-2-3

Credits: 2 $\frac{2}{3}$

Periods of instruction: 75

Indications: Orbitals and probability of presence of electrons, quantum numbers.  
Elements: periodic table, normal physical state, periodic properties of elements, oxidization numbers.  
Terminology of elements and inorganic compounds.  
Energy in the formation of chemical bonds.  
Intermolecular bonds.  
Prediction of molecular structures.  
Intermolecular bonds and states of matter.  
Basic experimental techniques in chemistry.

**Objective**

**Standard**

**Statement of the Competency**

Apply the methods of differential calculus to the study of functions and problem solving.

**Elements of the Competency**

**Performance Criteria**

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| <ol style="list-style-type: none"> <li>1. Recognize and describe the characteristics of a function expressed in symbolic or graphic form.</li> <li>2. Determine whether a function has a limit or is continuous or has a derivative at a point or on an interval.</li> <li>3. Apply the rules and techniques of differentiation.</li> <li>4. Use the derivative and related concepts to analyze the variations of a function and graph it.</li> <li>5. Solve optimization and rate of change problems.</li> </ol> | <ul style="list-style-type: none"> <li>• Proper use of concepts</li> <li>• Representation of a situation as a function</li> <li>• Accurate graphic representation of a function</li> <li>• Correct choice and application of differentiation techniques</li> <li>• Algebraic operations in conformity with rules</li> <li>• Accuracy of calculations</li> <li>• Correct interpretation of results</li> <li>• Explanation of steps in problem-resolution procedure</li> <li>• Use of appropriate terminology</li> </ul> |
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**Learning Activities**

Discipline:	Mathematics
Weighting:	3-2-3
Credits:	2 $\frac{2}{3}$
Periods of instruction:	75
Indications:	<p>Functions: algebraic, exponential, logarithmic, trigonometric and inverse trigonometric.</p> <p>Limit: intuitive approach, definition, properties, calculation of limits.</p> <p>Continuity: definition and properties.</p> <p>Derivative: geometric interpretation, definition, standard rules and techniques.</p> <p>Applications: study of curves, optimization problems, rates of change.</p>

<i>Objective</i>	<i>Standard</i>
<b>Statement of the Competency</b>	
Apply the methods of integral calculus to the study of functions and problem solving.	
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
<ol style="list-style-type: none"> <li>1. Determine the indefinite integral of a function.</li> <li>2. Calculate the limits of indeterminate forms.</li> <li>3. Calculate the definite integral and the improper integral of a function on an interval.</li> <li>4. Express concrete problems as differential equations and solve simple differential equations.</li> <li>5. Calculate volumes, areas and lengths and draw two- and three-dimensional representations.</li> <li>6. Analyze the convergence of infinite series.</li> </ol>	<ul style="list-style-type: none"> <li>• Proper use of concepts</li> <li>• Adequate two- and three-dimensional representations of surfaces and solids of revolution</li> <li>• Algebraic operations in conformity with rules</li> <li>• Correct choice and application of rules and techniques of integration</li> <li>• Accuracy of calculations</li> <li>• Justification of steps in the solution</li> <li>• Correct interpretation of results</li> <li>• Use of appropriate terminology</li> </ul>
<b>Learning Activities</b>	
Discipline:	Mathematics
Weighting:	3-2-3
Credits:	2 $\frac{2}{3}$
Periods of instruction:	75
Indications:	Limit: indeterminate forms, l'Hospital's rule. Standard rules and techniques of integration. Properties of the indefinite integral and the definite integral. Calculation of lengths, areas and volumes. The Fundamental Theorem of Calculus. Differential equations in separable variables. The Taylor and MacLaurin series.

**Objective**

**Standard**

**Statement of the Competency**

Apply the methods of linear algebra and vector geometry to problem solving.

**Elements of the Competency**

**Performance Criteria**

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| <ol style="list-style-type: none"> <li>1. Express concrete problems as linear equations.</li> <li>2. Solve systems of linear equations using matrices.</li> <li>3. Establish connections between geometry and algebra.</li> <li>4. Determine the equation of geometric loci (straight lines and planes) and find their intersections.</li> <li>5. Calculate angles, lengths, areas and volumes.</li> <li>6. Demonstrate propositions.</li> <li>7. Make two- and three-dimensional drawings of loci.</li> </ol> | <ul style="list-style-type: none"> <li>• Proper use of concepts</li> <li>• Representation of situations in terms of vectors and matrices</li> <li>• Correct application of algorithms</li> <li>• Correct solution of systems of linear equations</li> <li>• Adequate representation of loci</li> <li>• Justification of the steps in the solution</li> <li>• Algebraic operations in conformity with rules</li> <li>• Accuracy of calculations</li> <li>• Correct interpretation of results</li> <li>• Use of appropriate terminology</li> </ul> |
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**Learning Activities**

Discipline: Mathematics

Weighting: 3-2-3

Credits: 2 $\frac{2}{3}$

Periods of instruction: 75

Indications: Matrix and determinant: definitions, properties, operations, applications.  
 The Gauss-Jordan and inverse matrix methods of solving systems of linear equations.  
 Geometric and algebraic vectors: definition, representation, properties, operations, applications.  
 Products of vectors: dot, cross and scalar triple product.  
 Vector space: coordinate system, basis, dimension, linear combination, linear independence.  
 Geometric applications: straight lines and planes, intersections of loci, calculations of angles and distances.

**Objective**

**Standard**

**Statement of the Competency**

Analyze various situations and phenomena in physics using the basic principles of classical mechanics.

**Elements of the Competency**

**Performance Criteria**

1. Describe the translation and rotation motions of bodies.
2. Apply the concepts and laws of dynamics to the analysis of the motion of bodies.
3. Measure the amount of work and energy involved in simple situations.
4. Apply the principles of conservation in mechanics.
5. Verify experimentally a number of laws and principles in mechanics.

- Proper use of concepts, laws and principles
- Adequate representation of situations in physics
- Use of appropriate terminology
- Graphic and mathematical representations adapted to the nature of the problem
- Justification of steps in the analysis of situations
- Rigorous application of Newton's laws and the principles of conservation
- Critical evaluation of results
- Interpretation of the limits of the models
- Meticulous experimentation
- Laboratory report in line with established standards

**Learning Activities**

Discipline: Physics

Weighting: 3-2-3

Credits: 2 $\frac{2}{3}$

Periods of instruction: 75

Indications: Scalar and vector quantities: units and dimensions.  
 Kinematics of the various aspects of rotation and translation: position, displacement, linear and angular velocity, acceleration.  
 Force, dynamics of translation and rotation.  
 Energy and mechanical work.  
 Principles of conservation of energy and quantity of motion.

**Objective**

**Standard**

**Statement of the Competency**

Analyze various situations and phenomena in physics using the basic laws of electricity and magnetism.

**Elements of the Competency**

1. Analyze situations in physics associated with static electric charge and electric current.
2. Analyze situations in physics associated with magnetism and magnetic induction.
3. Apply the laws of electricity and magnetism.
4. Verify experimentally a number of laws of electricity and magnetism.

**Performance Criteria**

- Proper use of concepts, principles and laws
- Adequate representation of situations in physics
- Graphic and mathematical representations adapted to the nature of the problem
- Justification of steps in the analysis of situations
- Rigorous application of the laws of electricity and magnetism
- Critical evaluation of results
- Interpretation of the limits of the models
- Meticulous experimentation
- Appropriate use of measuring instruments
- Laboratory report in line with established standards

**Learning Activities**

Discipline: Physics

Weighting: 3-2-3

Credits: 2 $\frac{2}{3}$

Periods of instruction: 75

Indications: Electrostatics: charge, field, potential, energy.  
 Electro-kinematics: current, circuit, energy, power.  
 Magnetism: magnet, force, magnetic field.  
 Electromagnetic induction: induced current, alternating current.

**Objective**

**Standard**

**Statement of the Competency**

Analyze various situations or phenomena associated with waves, optics and modern physics using basic principles.

**Elements of the Competency**

**Performance Criteria**

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| <ol style="list-style-type: none"> <li>1. Apply the basic principles of physics to the description of vibrations and waves and their transmission.</li> <li>2. Apply the laws of geometric optics.</li> <li>3. Apply the characteristics of waves to light phenomena.</li> <li>4. Analyze a number of situations using concepts of modern physics.</li> <li>5. Verify experimentally a number of laws and principles associated with waves, optics and modern physics.</li> </ol> | <ul style="list-style-type: none"> <li>• Proper use of concepts, principles and laws</li> <li>• Adequate representation of situations in physics</li> <li>• Graphic and mathematical representations adapted to the nature of the problem</li> <li>• Justification of steps in the analysis of situations</li> <li>• Rigorous application of the main models</li> <li>• Critical evaluation of results</li> <li>• Interpretation of the limits of the models</li> <li>• Meticulous experimentation</li> <li>• Laboratory report in line with established standards</li> </ul> |
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**Learning Activities**

Discipline: Physics  
 Weighting: 3-2-3  
 Credits: 2½  
 Periods of instruction: 75  
 Indications: Kinematics and dynamics of vibrations.  
 Longitudinal and transverse waves.  
 Progressive and stationary waves, resonance.  
 Sound waves.  
 Elements of modern physics.  
 Geometric and physical optics.

Objectives and Standards of the *Computer Science and Mathematics (200.CO)* Program

Code: 020V

<i>Objective</i>	<i>Standard</i>
<b>Statement of the Competency</b>	
Apply basic concepts in discrete mathematics to problem solving.	
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
<ol style="list-style-type: none"> <li>1. Apply concepts of set theory and logic.</li> <li>2. Develop the steps of a simple mathematical proof.</li> <li>3. Apply the rules and concepts of modular arithmetic and number systems.</li> <li>4. Use the elementary principles of enumeration.</li> <li>5. Define a recursive function.</li> <li>6. Find the solution of a function defined by a second order linear recurrence equation.</li> <li>7. Draw graphs to represent a situation.</li> </ol>	<ul style="list-style-type: none"> <li>• Appropriate use of concepts</li> <li>• Appropriate use of Boolean algebra to design a logical circuit</li> <li>• Correct choice and application of proof techniques</li> <li>• Correct use of Euclid's algorithm and modular arithmetic</li> <li>• Appropriate use of counting formulas for problem solving</li> <li>• Correct conversion of integers between different bases</li> <li>• Correct solution of a second order linear recurrence equation</li> <li>• Appropriate knowledge of graph-related terminology</li> <li>• Correct determination and use of a graph's adjacency matrix</li> </ul>
<b>Learning Activities</b>	
Discipline:	Mathematics
Weighting:	3-2-3
Credits:	2½
Periods of instruction:	75
Indications:	Terminology of set theory, universal quantifiers, truth tables, equivalence operations (if-and-only-if). Direct and indirect proofs, recursive proof (mathematical induction), ad absurdum proof. Integer division. Euclid's theorem. Greatest common divisor. Principles of cryptography. Injective, bijective, surjective functions. Pigeonhole principle. Combinations, arrangements, permutations, binomial theorem, Pascal's triangle. Graphs (edge, vertex, path, type).

<i>Objective</i>	<i>Standard</i>
<b>Statement of the Competency</b>	
Develop programs to solve simple problems.	
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Develop algorithmic solutions to simple problems.	<ul style="list-style-type: none"> <li>• Accurate analysis of the situation with respect to available data, the desired results and the processing required</li> <li>• Design of an effective algorithm</li> <li>• Proper validation of an algorithm by means of a complete set of tests</li> </ul>
2. Use a programming language.	<ul style="list-style-type: none"> <li>• Accurate recognition of the characteristics and functions of a computer and its network</li> <li>• Correct use of a work station in a development environment</li> <li>• Correct algorithm translation</li> <li>• Strict application of programming standards</li> <li>• Effective use of the development environment's functions in searching for and correcting compilation errors</li> <li>• Correct application of the set of tests required to check the program's operation</li> <li>• Appropriate debugging of the program according to the algorithm</li> <li>• Accurate comprehension of the basic concepts of object-oriented programming: class, object, method, attribute</li> </ul>
<b>Learning Activities</b>	
Discipline:	Computer Science
Weighting:	2-3-3
Credits:	2½
Periods of instruction:	75

<i>Objective</i>		<i>Standard</i>
<b>Statement of the Competency</b>		<b>Achievement Context</b>
Organize and manipulate data.		<ul style="list-style-type: none"> <li>For programs to be developed and already developed</li> </ul>
<b>Elements of the Competency</b>		<b>Performance Criteria</b>
1. Apply an object-oriented development approach.		<ul style="list-style-type: none"> <li>Correct understanding of the basic principles of object-oriented programming</li> <li>Rigorous application of object-oriented programming principles and techniques: encapsulation, inheritance, polymorphism</li> </ul>
2. Organize the data logically.		<ul style="list-style-type: none"> <li>Correct analysis of the context for using the data</li> <li>Sound comparison of the possibilities offered by different data structures</li> <li>Choice suited to the context of the data structures</li> <li>Correct implementation of chosen data structures</li> </ul>
3. Manipulate data in memory.		<ul style="list-style-type: none"> <li>Correct use of updating, sorting and search techniques with data in memory</li> </ul>
4. Manipulate data in files.		<ul style="list-style-type: none"> <li>Correct use of basic file data storage techniques: reading and writing</li> </ul>
<b>Learning Activities</b>		
Discipline:	Computer Science	
Weighting:	2-3-3	
Credits:	2 $\frac{2}{3}$	
Periods of instruction:	75	

<i>Objective</i>		<i>Standard</i>
<b>Statement of the Competency</b>		<b>Achievement Context</b>
Design and develop programs in a graphic environment.		<ul style="list-style-type: none"> <li>• In an object-oriented programming environment</li> </ul>
<b>Elements of the Competency</b>		<b>Performance Criteria</b>
1. Establish the program functions.		<ul style="list-style-type: none"> <li>• Clarification of the basic goal of the program</li> <li>• Appropriate determination of the program's functional requirements</li> <li>• Appropriate determination of the user interface requirements</li> </ul>
2. Design the program.		<ul style="list-style-type: none"> <li>• Design of a functional and user-friendly interface</li> <li>• Appropriate organization of data for implementing the program functions</li> <li>• Correct determination of processing required for implementing the program functions</li> <li>• Correct application of the principles of the object-oriented approach</li> </ul>
3. Develop the program.		<ul style="list-style-type: none"> <li>• Correct implementation of the user interface</li> <li>• Appropriate use of program libraries</li> <li>• Appropriate programming of modules</li> <li>• Rigorous validation of proper program operation</li> </ul>
<b>Learning Activities</b>		
Discipline:	Computer Science	
Weighting:	2-3-3	
Credits:	2 $\frac{2}{3}$	
Periods of instruction:	75	

<i>Objective</i>		<i>Standard</i>
<b>Statement of the Competency</b>		<b>Achievement Context</b>
Demonstrate their integration of the learning in the <i>Computer Science and Mathematics</i> program.		<ul style="list-style-type: none"> <li>• Through a team project</li> <li>• Through an oral presentation and a written production</li> </ul>
<b>Elements of the Competency</b>		<b>Performance Criteria</b>
1. Recognize the contribution of all subjects to their education.		<ul style="list-style-type: none"> <li>• Meaningful summary of what they have learned</li> <li>• Suitable justification of the relevance of their learning</li> </ul>
2. Apply the knowledge they have acquired to a new or complex situation.		<ul style="list-style-type: none"> <li>• Adequate integration of at least two science subjects, including computer science</li> <li>• Appropriate use of the knowledge they have acquired</li> <li>• Appropriate demonstration of the novelty or complexity of the situation</li> </ul>
3. Develop a scientific computer application that integrates the knowledge they have acquired.		<ul style="list-style-type: none"> <li>• Establishment of the comprehensive general framework of the team project</li> <li>• Precise definition of the problem to be solved</li> <li>• Accurate description of the solution</li> <li>• Appropriate implementation of the solution</li> <li>• Appropriate validation of results obtained</li> <li>• Clear communication of the results of the procedure, orally and in writing</li> </ul>
4. Evaluate, working alone, the integration procedure used.		<ul style="list-style-type: none"> <li>• Precise description of the procedure used in their integration project</li> <li>• Explicit reference to the learning that is considered important for solving the problems encountered in carrying out this project</li> <li>• Appropriate analysis of the strengths and weaknesses of the project</li> <li>• Relevant indication of repercussions of the project</li> <li>• Suitable evaluation of their contribution to the team effort</li> </ul>
<b>Learning Activities</b>		
Discipline:	Computer Science	
Weighting:	1-4-3	
Credits:	2 $\frac{2}{3}$	
Periods of instruction:	75	

## General Education Component Common to All Programs and General Education Component Specific to the Program

English, Language of Instruction and Literature		Code: 4EA0
<b>Objective</b>	<b>Standard</b>	
<b>Statement of the Competency</b>		
Analyze and produce various forms of discourse.		
<b>Elements of the Competency</b>	<b>Performance Criteria</b>	
1. Identify the characteristics and functions of the components of literary texts.	<ul style="list-style-type: none"> <li>• Accurate explanation of the denotation of words</li> <li>• Adequate recognition of the appropriate connotation of words</li> <li>• Accurate definition of the characteristics and function of each component</li> </ul>	
2. Determine the organization of facts and arguments of a given literary text.	<ul style="list-style-type: none"> <li>• Clear and accurate recognition of the main idea and structure</li> <li>• Clear presentation of the strategies employed to develop an argument or thesis</li> </ul>	
3. Prepare ideas and strategies for a projected discourse.	<ul style="list-style-type: none"> <li>• Appropriate identification of topics and ideas</li> <li>• Adequate gathering of pertinent information</li> <li>• Clear formulation of a thesis</li> <li>• Coherent ordering of supporting material</li> </ul>	
4. Formulate a discourse.	<ul style="list-style-type: none"> <li>• Appropriate choice of tone and diction</li> <li>• Correct development of sentences</li> <li>• Clear and coherent development of paragraphs</li> <li>• Formulation of a 750-word discourse</li> </ul>	
5. Revise the work.	<ul style="list-style-type: none"> <li>• Appropriate use of revision strategies</li> <li>• Appropriate revision of form and content</li> </ul>	
<b>Learning Activities</b>		
Discipline:	English, Language of Instruction and Literature	
Weighting:	2-2-4 or 1-3-4	
Credits:	2½	

**Objective**

**Standard**

**Statement of the Competency**

Apply an analytical approach to literary genres.

**Elements of the Competency**

**Performance Criteria**

1. Distinguish genres of literary texts.	<ul style="list-style-type: none"> <li>• Clear recognition of the formal characteristics of a literary genre</li> </ul>
2. Recognize the use of literary conventions within a specific genre.	<ul style="list-style-type: none"> <li>• Accurate recognition of the figurative communication of meaning</li> <li>• Adequate explanation of the effects of significant literary and rhetorical devices</li> </ul>
3. Situate a work within its historical and literary period.	<ul style="list-style-type: none"> <li>• Appropriate recognition of the relationship of a text to its period</li> </ul>
4. Write a critical analysis of a literary genre.	<ul style="list-style-type: none"> <li>• Selective use of appropriate terminology</li> <li>• Effective presentation of a 1000-word coherent response to a literary text</li> </ul>
5. Revise the work.	<ul style="list-style-type: none"> <li>• Appropriate use of revision strategies</li> <li>• Appropriate revision of form and content</li> </ul>

**Learning Activities**

Discipline: English, Language of Instruction and Literature  
Weighting: 2-2-3  
Credits: 2½

**Objective**

**Standard**

**Statement of the Competency**

Apply an analytical approach to a literary theme.

**Elements of the Competency**

**Performance Criteria**

1. Recognize the treatment of a theme within a literary text.	<ul style="list-style-type: none"> <li>• Clear recognition of elements within the text, which define and reinforce a theme and its development</li> <li>• Adequate demonstration of the effects of significant literary and rhetorical devices</li> </ul>
2. Situate a literary text within its cultural context.	<ul style="list-style-type: none"> <li>• Appropriate recognition of a text as an expression of cultural context</li> <li>• Adequate demonstration of the effects of significant literary and rhetorical devices</li> </ul>
3. Detect the value system inherent in a literary text.	<ul style="list-style-type: none"> <li>• Appropriate identification of expression (explicit / implicit) of a value system in a text</li> </ul>
4. Write an analysis on a literary theme.	<ul style="list-style-type: none"> <li>• Selective use of appropriate terminology</li> <li>• Effective presentation of a 1000-word coherent response to a literary text</li> </ul>
5. Revise the work.	<ul style="list-style-type: none"> <li>• Appropriate use of revision strategies</li> <li>• Appropriate revision of form and content</li> </ul>

**Learning Activities**

Discipline: English, Language of Instruction and Literature  
Weighting: 2-2-3  
Credits: 2½

**Objective**

**Standard**

**Statement of the Competency**

Communicate in the forms of discourse appropriate to one or more fields of study.

**Elements of the Competency**

**Performance Criteria**

1. Identify the forms of discourse appropriate to given fields of study.	<ul style="list-style-type: none"> <li>• Accurate recognition of specialized vocabulary and conventions</li> <li>• Accurate recognition of the characteristics of the form of discourse</li> <li>• Exploration of a variety of topics</li> </ul>
2. Recognize the forms of discourse appropriate to given fields of study.	<ul style="list-style-type: none"> <li>• Clear and accurate recognition of the main ideas and structure</li> <li>• Appropriate distinction between fact and argument</li> </ul>
3. Formulate an oral and a written discourse.	<ul style="list-style-type: none"> <li>• Examine ways to address and structure a given topic</li> <li>• Appropriate choice of tone and diction</li> <li>• Correctly developed sentences</li> <li>• Clearly and coherently developed paragraphs</li> <li>• Appropriate use of program-related communication strategies including media and technology</li> <li>• Formulation of a 1000-word discourse</li> </ul>
4. Revise the work.	<ul style="list-style-type: none"> <li>• Appropriate use of revision strategies</li> <li>• Appropriate revision of form and content</li> </ul>

**Learning Activities**

Discipline: English, Language of Instruction and Literature  
 Periods of instruction: 60  
 Credits: 2

General Education Component Common to All Programs  
and General Education Component Specific to the Program

Humanities

Code: 4HU0

**Objective**

**Standard**

**Statement of the Competency**

Apply a logical analytical process to how knowledge is organized and used.

**Elements of the Competency**

**Performance Criteria**

1. Recognize the basic elements of a field of knowledge.	<ul style="list-style-type: none"> <li>• Appropriate description of the basic elements</li> <li>• Appropriate use of terminology relevant to a field of knowledge</li> </ul>
2. Define the modes of organization and utilization of a field of knowledge.	<ul style="list-style-type: none"> <li>• Adequate definition of the dimensions, limits, and uses of a field of knowledge</li> </ul>
3. Situate a field of knowledge within its historical context.	<ul style="list-style-type: none"> <li>• Accurate identification of the main components in the historical development of a field of knowledge</li> <li>• Accurate description of the effects of historical development and social context on the limits and uses of a field of knowledge</li> </ul>
4. Organize the main components into coherent patterns.	<ul style="list-style-type: none"> <li>• Coherent organization of the main components</li> </ul>
5. Produce a synthesis of the main components.	<ul style="list-style-type: none"> <li>• Appropriate analysis of the components</li> <li>• Coherent synthesis of the main components</li> <li>• Appropriate expression, including a significant individual written component, of an analysis of the context, importance and implications of the organization and uses of knowledge</li> <li>• Appropriate use of revision strategies</li> <li>• Appropriate revision of form and content</li> </ul>

**Learning Activities**

Discipline: Humanities  
Weighting: 3-1-3  
Credits: 2½

**Objective**

**Standard**

**Statement of the Competency**

Apply a critical thought process to world views.

**Elements of the Competency**

**Performance Criteria**

1. Describe world views.	<ul style="list-style-type: none"> <li>• Accurate description of a society or group with a distinctive world view</li> <li>• Appropriate use of terminology relevant to these societies or groups</li> </ul>
2. Explain the major ideas, values, and implications associated with a given world view.	<ul style="list-style-type: none"> <li>• Adequate explanation of the salient components of a world view</li> </ul>
3. Organize the ideas, values and experiences of a world view into coherent patterns.	<ul style="list-style-type: none"> <li>• Coherent organization of ideas about a world view</li> <li>• Appropriate expression, including a significant individual written component, of an analysis of the context, importance, and implications of world views</li> </ul>
4. Compare world views.	<ul style="list-style-type: none"> <li>• Comparative analysis of these world views</li> <li>• Appropriate inclusion of central elements, relationships, and organizational principles of the societies or groups in the analysis</li> </ul>
5. Convey the ideas, attitudes, and experiences of the societies or groups studied.	<ul style="list-style-type: none"> <li>• Coherent integration of the importance and implications of the world views for the given societies or groups</li> <li>• Appropriate use of revision strategies</li> <li>• Appropriate revision of form and content</li> </ul>

**Learning Activities**

Discipline: Humanities  
Weighting: 3-0-3  
Credits: 2

**Objective**

**Standard**

**Statement of the Competency**

Apply a critical thought process to ethical issues relevant to the field of study.

**Elements of the Competency**

**Performance Criteria**

1. Situate significant ethical issues in appropriate world views and fields of knowledge.	<ul style="list-style-type: none"> <li>• Accurate recognition of the basic elements of ethical issues</li> <li>• Appropriate use of relevant terminology</li> <li>• Adequate identification of the main linkages with world views and fields of knowledge</li> </ul>
2. Explain the major ideas, values, and social implication of ethical issues.	<ul style="list-style-type: none"> <li>• Adequate description of the salient components of the issues</li> </ul>
3. Organize the ethical questions and their implications into coherent patterns.	<ul style="list-style-type: none"> <li>• Coherent organization of the ethical questions and their implications</li> <li>• Appropriate expression, including a significant individual written component, of an analysis of the context, importance and implications of the issues</li> </ul>
4. Debate the ethical issues.	<ul style="list-style-type: none"> <li>• Adequate development of substantiated argumentation including context and diverse points of view</li> <li>• Clear articulation of an individual point of view</li> <li>• Appropriate use of revision strategies</li> <li>• Appropriate revision of form and content</li> </ul>

**Learning Activities**

Discipline:	Humanities
Periods of instruction:	45
Credits:	2

**Objective**

**Standard**

**Statement of the Competency**

Apply basic concepts for communicating in standard French.

**Elements of the Competency**

**Performance Criteria**

<p>1. Write and revise a simple text.</p>	<ul style="list-style-type: none"> <li>• Clear, coherent formulation of a text of about 250 words</li> <li>• Adequate development of the text: intention, topic, reader</li> <li>• Formulation of simple, well-constructed sentences</li> <li>• Use of adequate vocabulary for the task</li> <li>• Satisfactory application of the rules of grammar, in particular agreement in gender and number; regular verbs; verb tenses in the present, compound past and simple future</li> <li>• Satisfactory correction of errors in spelling or grammar</li> <li>• Appropriate use of revision strategies</li> </ul>
<p>2. Understand the meaning of a simple text.</p>	<ul style="list-style-type: none"> <li>• Accurate description of the general meaning and essential ideas of a 500-word text</li> <li>• Accurate identification of the difficulties in understanding the text</li> <li>• Appropriate use of reading techniques</li> <li>• Accurate identification of the main elements of the text</li> </ul>
<p>3. Convey a simple oral message.</p>	<ul style="list-style-type: none"> <li>• Clear and coherent formulation of an oral presentation of at least four minutes</li> <li>• Appropriate use of standard vocabulary</li> <li>• Clear and coherent statements</li> </ul>
<p>4. Understand the meaning of a simple oral message.</p>	<ul style="list-style-type: none"> <li>• Accurate identification of the general meaning and essential ideas of an oral message of at least four minutes</li> <li>• Accurate identification of the difficulties in understanding the message</li> <li>• Accurate description of the general meaning and essential ideas of the message</li> </ul>

**Learning Activities**

Discipline: French as a Second Language  
Weighting: 2-1-3  
Credits: 2

**Objective**

**Standard**

**Statement of the Competency**

Communicate in standard French with some ease.

**Elements of the Competency**

**Performance Criteria**

1. Write and revise a simple text.

- Writing of a text of about 350 words
- Respect for grammar and spelling rules
- Appropriate use of the main elements of the corpus
- Clear, coherent formulation of sentences
- Coherent organization of paragraphs
- Appropriate use of revision strategies
- Satisfactory correction of spelling and grammatical errors

2. Interpret a written text.

- Accurate identification of the main ideas and structure of a text of 700 to 1 000 words
- Accurate identification of the main elements of the text
- Accurate explanation of the meaning of the words of the text

3. Produce a planned oral text.

- Clear and coherent formulation of an oral presentation of at least five minutes
- Appropriate use of standard vocabulary
- Respect for the level of language and rules of grammar and pronunciation

4. Interpret a simple oral text.

- Accurate identification of the main elements of an oral text of at least five minutes
- Accurate identification of the ideas and subjects dealt with in the text
- Accurate explanation of the meaning of the words of the text

**Learning Activities**

Discipline: French as a Second Language

Weighting: 2-1-3

Credits: 2

**Objective**

**Standard**

**Statement of the Competency**

Communicate with ease in standard French.

**Elements of the Competency**

**Performance Criteria**

1. Write a text of moderate complexity.	<ul style="list-style-type: none"> <li>• Writing of a text of about 450 words</li> <li>• Respect for grammar and spelling rules</li> <li>• Adaptation to the intended audience</li> <li>• Appropriate use of the main elements of the corpus</li> <li>• Clear and coherent formulation of sentences, including at least three that are complex</li> <li>• Coherent organization of paragraphs</li> </ul>
2. Revise and correct a text of moderate complexity.	<ul style="list-style-type: none"> <li>• Appropriate use of revision strategies</li> <li>• Appropriate revision of the text</li> </ul>
3. Comment on a written text of moderate complexity.	<ul style="list-style-type: none"> <li>• Accurate identification of the main elements of a text of between 2 500 and 3 000 words</li> <li>• Accurate explanation of the meaning of the words of the text</li> <li>• Accurate identification of the main and secondary ideas, of facts and opinions</li> <li>• Accurate identification of what is implicit and what is explicit</li> </ul>
4. Produce a planned oral text of moderate complexity.	<ul style="list-style-type: none"> <li>• Clear and coherent formulation of an oral presentation of at least five minutes</li> <li>• Appropriate use of standard vocabulary</li> <li>• Respect for the level of language and rules of grammar and pronunciation</li> <li>• Adaptation to the intended audience</li> <li>• Appropriate sequencing of ideas</li> </ul>

**Learning Activities**

Discipline: French as a Second Language

Weighting: 2-1-3

Credits: 2

**Objective**

**Standard**

**Statement of the Competency**

Explore a cultural and literary topic.

**Elements of the Competency**

**Performance Criteria**

1. Write a text on a cultural or literary topic.

- Clear and coherent formulation of a text of about 550 words
- Respect for the topic
- Respect for grammar and spelling rules
- Adaptation to the intended audience
- Appropriate use of the main elements of the corpus
- Clear articulation of a personal point of view

2. Revise and correct a text on a cultural or literary topic.

- Appropriate use of revision strategies
- Appropriate revision of the text

3. Analyze a cultural or literary text.

- Personal formulation of the main elements of the text
- Identification of the main themes
- Identification of clues that help situate the text in its sociocultural and historical context
- Accurate identification of the values expressed
- Accurate identification of the structure of the text
- Clear articulation of a personal point of view

**Learning Activities**

Discipline: French as a Second Language

Weighting: 3-0-3

Credits: 2

**Objective**

**Standard**

**Statement of the Competency**

Apply basic concepts for communicating in French in relation to the student's field of study.

**Elements of the Competency**

**Performance Criteria**

<p>1. Write and revise a short text related to the student's field of study.</p>	<ul style="list-style-type: none"> <li>• Accurate identification of difficulties in writing</li> <li>• Appropriate use of writing techniques</li> <li>• Appropriate use of standard and specialized vocabulary</li> <li>• Clear and coherent formulation of the text</li> <li>• Appropriate use of revision strategies</li> <li>• Satisfactory correction of spelling and grammatical errors</li> </ul>
<p>2. Understand the meaning and characteristics of a text related to the student's field of study.</p>	<ul style="list-style-type: none"> <li>• Accurate identification of difficulties in understanding the text</li> <li>• Accurate identification of the characteristics of the text</li> <li>• Accurate identification of specialized vocabulary</li> <li>• Accurate identification of the main elements of the text</li> <li>• Accurate description of the general meaning and essential ideas of the text</li> </ul>
<p>3. Convey a simple oral message related to the student's field of study.</p>	<ul style="list-style-type: none"> <li>• Accurate identification of the difficulties in oral expression</li> <li>• Appropriate use of techniques of oral expression</li> <li>• Appropriate use of standard and specialized vocabulary</li> <li>• Intelligible expression of the message</li> </ul>
<p>4. Understand the meaning of a simple oral message related to the student's field of study.</p>	<ul style="list-style-type: none"> <li>• Accurate identification of difficulties in understanding the message</li> <li>• Accurate identification of the characteristics of the message</li> <li>• Accurate identification of specialized vocabulary</li> <li>• Accurate identification of the main elements of the message</li> <li>• Accurate description of the general meaning and essential ideas of the message</li> </ul>

**Learning Activities**

Discipline:	French as a Second Language
Periods of instruction:	45
Credits:	2

General Education Component Common to All Programs  
and General Education Component Specific to the Program

French as a Second Language (Level II)

Code: 4SFQ

**Objective**

**Standard**

**Statement of the Competency**

Communicate in French on topics related to the student's field of study.

**Elements of the Competency**

**Performance Criteria**

1. Write a text related to the student's field of study.	<ul style="list-style-type: none"> <li>• Appropriate use of specialized vocabulary and of conventions specific to different types of texts</li> <li>• Respect for the level of language and rules of grammar and spelling</li> <li>• Clear and coherent formulation of the text</li> <li>• Appropriate use of writing techniques</li> </ul>
2. Revise and correct a text on a topic related to the student's field of study.	<ul style="list-style-type: none"> <li>• Appropriate use of revision strategies</li> <li>• Satisfactory correction of spelling and grammatical errors</li> </ul>
3. Differentiate the types of texts specific to the student's field of study.	<ul style="list-style-type: none"> <li>• Accurate identification of the formal characteristics of each of the main types of texts and the conventions used</li> </ul>
4. Analyze texts representative of the student's field of study.	<ul style="list-style-type: none"> <li>• Accurate identification of the main elements of the text</li> <li>• Accurate interpretation of specialized vocabulary</li> <li>• Accurate identification of the ideas and subjects dealt with</li> <li>• Appropriate use of reading and listening techniques</li> </ul>

**Learning Activities**

Discipline:	French as a Second Language
Periods of instruction:	45
Credits:	2

**Objective**

**Standard**

**Statement of the Competency**

Communicate with ease in French on topics related to the student's field of study.

**Elements of the Competency**

**Performance Criteria**

<p>1. Produce a text on a topic related to the student's field of study.</p>	<ul style="list-style-type: none"> <li>• Respect for the topic</li> <li>• Appropriate use of specialized vocabulary and the conventions specific to different types of texts</li> <li>• Respect for the level of language and rules of grammar and spelling</li> <li>• Clear and coherent formulation of the text</li> <li>• Appropriate sequencing of ideas</li> <li>• Appropriate form for the content</li> </ul>
<p>2. Revise and correct a text on a topic related to the student's field of study.</p>	<ul style="list-style-type: none"> <li>• Appropriate use of revision strategies</li> <li>• Satisfactory correction of spelling and grammatical errors</li> </ul>
<p>3. Comment on texts specific to the student's field of study.</p>	<ul style="list-style-type: none"> <li>• Accurate identification of the formal characteristics of the main types of texts and the conventions used</li> <li>• Accurate explanation of the meaning of the words in the text</li> <li>• Accurate identification of the structure of the text</li> <li>• Accurate reformulation of the main and secondary ideas, of the facts and opinions</li> <li>• Accurate use of specialized vocabulary</li> </ul>

**Learning Activities**

Discipline:	French as a Second Language
Periods of instruction:	45
Credits:	2

**Objective**

**Standard**

**Statement of the Competency**

Produce a text in French on a topic related to the student's field of study.

**Elements of the Competency**

**Performance Criteria**

1. Write a text on a topic related to the student's field of study.

- Respect for the topic
- Appropriate use of specialized vocabulary and the conventions specific to different types of texts
- Appropriate choice of the main elements of the corpus based on the type of text
- Clear and coherent formulation of the text
- Respect for the level of language and rules of grammar and spelling
- Clear articulation of a personal point of view

2. Revise and correct a text on a topic related to the student's field of study.

- Appropriate use of revision strategies
- Satisfactory correction of spelling and grammatical errors

3. Analyze a text related to the student's field of study.

- Precise differentiation of the formal characteristics of specific types of texts
- Personal formulation of the main elements
- Listing of the main themes
- Accurate identification of the structure of the text
- Identification of clues that help situate the text in its context
- Clear articulation of a personal point of view
- Accurate association of elements of the text with the topic

**Learning Activities**

Discipline: French as a Second Language  
Periods of instruction: 45  
Credits: 2

**Objective**

**Standard**

**Statement of the Competency**

Analyze one's physical activity from the standpoint of a healthy lifestyle.

**Elements of the Competency**

**Performance Criteria**

1. Establish the relationship between one's lifestyle habits and health.	<ul style="list-style-type: none"> <li>• Proper use of documentation from scientific research or the media</li> <li>• Recognition of the influence of social and cultural factors on the practice of physical activity</li> <li>• Pertinent links made between one's lifestyle habits and the impact they have on health</li> </ul>
2. Be physically active in a manner that promotes one's health.	<ul style="list-style-type: none"> <li>• Respect for the rules specific to the physical activity practised</li> <li>• Respect for codes of ethics, safety rules and regulations when being physically active</li> <li>• Respect for one's abilities when practising physical activities</li> </ul>
3. Recognize one's needs, abilities and motivational factors with respect to regular and sufficient physical activity.	<ul style="list-style-type: none"> <li>• Appropriate use of strategies for the quantitative and qualitative evaluation of one's physical condition</li> <li>• Overall assessment of one's needs and abilities in terms of physical activity</li> <li>• Overall assessment of one's motivational factors with respect to being sufficiently active on a regular basis</li> </ul>
4. Propose physical activities that promote one's health.	<ul style="list-style-type: none"> <li>• Appropriate choice of physical activities according to one's needs, abilities and motivational factors</li> <li>• Use of clear reasoning to explain the choice of physical activity</li> </ul>

**Learning Activities**

Discipline: Physical Education  
Weighting: 1-1-1  
Credits: 1

**Objective**

**Standard**

**Statement of the Competency**

Improve one's effectiveness when practising a physical activity.

**Elements of the Competency**

**Performance Criteria**

1. Plan an approach to improve one's effectiveness when practising a physical activity.

- Initial assessment of one's abilities and attitudes when practising a physical activity
- Statement of one's expectations and needs with respect to the ability to practise the activity
- Appropriate formulation of personal objectives
- Appropriate choice of the means to achieve one's objectives
- Use of clear reasoning to explain the choice of physical activity

2. Use a planned approach to improve one's effectiveness when practising a physical activity.

- Respect for the rules and regulations of the physical activity
- Respect for codes of ethics, safety rules and regulations when being physically active
- Appropriate use of strategies for the quantitative and qualitative evaluation of one's motor skills
- Periodic assessment of one's abilities and attitudes when practising a physical activity
- Meaningful interpretation of progress made and the difficulties encountered in the practice of physical activity
- Pertinent, periodic and proper adjustments of one's objectives or means
- Appreciable improvement in one's motor skills, techniques or complex strategies required by the physical activity

**Learning Activities**

Discipline: Physical Education  
Weighting: 0-2-1  
Credits: 1

**Objective**

**Standard**

**Statement of the Competency**

Demonstrate one's ability to assume responsibility for maintaining a healthy lifestyle through the continued practice of physical activity.

**Elements of the Competency**

**Performance Criteria**

1. Plan a personal physical activity program.

- Mention of priorities according to one's needs, abilities, and motivational factors with respect to being sufficiently active on a regular basis
- Proper and appropriate formulation of personal objectives
- Appropriate choice of physical activity or activities to achieve personal objectives
- Appropriate planning of the conditions for performing the physical activity or activities in personal program

2. Combine the elements of a regular and sufficient practice of physical activity as part of a healthy lifestyle.

- Respect for the rules and regulations of the physical activity
- Respect for codes of ethics, safety rules and regulations when being physically active
- Regular and sufficient practice of a physical activity while maintaining a balance between effectiveness and health-promoting factors

3. Manage a personal physical activity program.

- Appropriate choice of criteria for measuring the attainment of program objectives
- Appropriate use of strategies for the quantitative and qualitative evaluation of one's physical activity
- Periodic assessment of the time invested and activities practised during the program
- Appropriate, periodic and proper adjustment of personal objectives or means used
- Meaningful interpretation of the progress made and difficulties encountered in the practice of physical activities
- Recognition of the effect of physical activity on one's lifestyle

**Learning Activities**

Discipline: Physical Education  
Weighting: 1-1-1  
Credits: 1

## Complementary General Education Component

Social Sciences		Code: 000V
<i>Objective</i>		<i>Standard</i>
<b>Statement of the Competency</b>	<b>Achievement Context</b>	
Estimate the contribution of the social sciences to an understanding of contemporary issues.	<ul style="list-style-type: none"> <li>• Working alone</li> <li>• In an essay of approximately 750 words on the contribution of the social sciences to an understanding of contemporary issues</li> <li>• Using documents and data from the field of social sciences</li> </ul>	
<b>Elements of the Competency</b>	<b>Performance Criteria</b>	
1. Recognize the focus of one or more of the social sciences and their main approaches.	<ul style="list-style-type: none"> <li>• Formulation of the focus specific to one or more of the social sciences</li> <li>• Description of the main approaches used in the social sciences</li> </ul>	
2. Identify some of the issues currently under study in the social sciences.	<ul style="list-style-type: none"> <li>• Association of issues with the pertinent areas of research in the social sciences</li> </ul>	
3. Demonstrate the contribution of one or more of the social sciences to an understanding of contemporary issues.	<ul style="list-style-type: none"> <li>• Presentation of contemporary issues by highlighting the interpretation of the social sciences</li> <li>• Illustration of the interaction between certain social changes and the contribution of the social sciences</li> </ul>	
<b>Learning Activities</b>		
Periods of instruction:	45	
Credits:	2	
Note:	Use the 300 or 400 series of codes (except codes 300 and 360) to link a course to objective 000V. Use code 305 for a multidisciplinary course. Codes 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.	

Social Sciences

Code: 000W

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Analyze one of the major problems of our time using one or more social scientific approaches.	<ul style="list-style-type: none"> <li>• Working alone</li> <li>• In an essay of approximately 750 words on a topic related to human existence</li> <li>• Using reference materials from the field of social sciences</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Formulate a problem using one or more social scientific approaches.	<ul style="list-style-type: none"> <li>• Presentation of the background to the problem</li> <li>• Use of appropriate concepts and language</li> <li>• Brief description of individual, collective, spatio-temporal and cultural aspects of the problem</li> </ul>
2. Address an issue using one or more social scientific approaches.	<ul style="list-style-type: none"> <li>• Clear formulation of an issue</li> <li>• Selection of pertinent reference materials</li> <li>• Brief description of historical, experimental and survey methods</li> </ul>
3. Draw conclusions.	<ul style="list-style-type: none"> <li>• Appropriate use of the selected method</li> <li>• Determination of appropriate evaluation criteria</li> <li>• Identification of strengths and weaknesses of the conclusions</li> <li>• Broadening of the issue analyzed</li> </ul>
<b>Learning Activities</b>	
Periods of instruction:	45
Credits:	2
Note:	<p>Use the 300 or 400 series of codes (except codes 300 and 360) to link a course to objective 000W.</p> <p>Use code 305 for a multidisciplinary course.</p> <p>Codes 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.</p>

<i>Objective</i>	<i>Standard</i>
<b>Statement of the Competency</b>	<b>Achievement Context</b>
Explain the general nature of science and technology and some of the major contemporary scientific or technological issues.	<ul style="list-style-type: none"> <li>• Working alone</li> <li>• Using a written commentary on a scientific discovery or technological development</li> <li>• In an essay of approximately 750 words</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Describe scientific thinking and the standard scientific method.	<ul style="list-style-type: none"> <li>• Brief description of the essential characteristics of scientific thinking, including quantification and demonstration</li> <li>• Ordered list and brief description of the essential characteristics of the main steps in the standard scientific method</li> </ul>
2. Demonstrate how science and technology are complementary.	<ul style="list-style-type: none"> <li>• Definition of terms and description of the primary ways in which science and technology are interrelated: logical and temporal connections, and mutual contributions</li> </ul>
3. Explain the context and the stages related to several scientific and technological discoveries.	<ul style="list-style-type: none"> <li>• Pertinent and coherent explanation of the relationship between the determining contexts related to several scientific and technological discoveries</li> <li>• Listing of the main stages of scientific and technological discoveries</li> </ul>
4. Deduce different consequences and questions resulting from certain recent scientific and technological developments.	<ul style="list-style-type: none"> <li>• Brief description of important consequences (of different types) and the current major challenges resulting from several scientific and technological discoveries</li> <li>• Formulation of relevant questions and credibility of responses to the questions formulated</li> </ul>
<b>Learning Activities</b>	
Periods of instruction:	45
Credits:	2
Note:	Use the 100 or 200 series of codes to link a course to objective 000X. Use code 105 for a multidisciplinary course. Codes 109, 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Resolve a simple problem by applying the basic scientific method.	<ul style="list-style-type: none"> <li>Working alone or in groups</li> <li>Applying the standard scientific method to a given, simple scientific and technological problem</li> <li>Using common scientific instruments and reference materials (written or other)</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Describe the main steps of the standard scientific method.	<ul style="list-style-type: none"> <li>Ordered list and brief description of the characteristics of the steps of the standard scientific method</li> </ul>
2. Formulate a hypothesis designed to solve a simple scientific and technological problem.	<ul style="list-style-type: none"> <li>Clear, precise description of the problem</li> <li>Observance of the principles for formulating a hypothesis (observable and measurable nature of data, credibility, etc.)</li> </ul>
3. Verify a hypothesis by applying the fundamental principles of the basic experimental method.	<ul style="list-style-type: none"> <li>Pertinence, reliability and validity of the experimental method used</li> <li>Observance of established experimental method</li> <li>Appropriate choice and use of instruments</li> <li>Clear, satisfactory presentation of results</li> <li>Validity of the connections established between the hypothesis, the verification and the conclusion</li> </ul>
<b>Learning Activities</b>	
Periods of instruction:	45
Credits:	2
Note:	Use the 100 or 200 series of codes to link a course to objective 000Y. Use code 105 for a multidisciplinary course. Codes 109, 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Communicate with limited skill in a modern language.	<ul style="list-style-type: none"> <li>• For modern Latin-alphabet languages:               <ul style="list-style-type: none"> <li>○ during a conversation consisting of at least eight lines of dialogue</li> <li>○ in a written text consisting of at least eight sentences</li> </ul> </li> <li>• For modern non–Latin-alphabet languages:               <ul style="list-style-type: none"> <li>○ during a conversation consisting of at least six lines of dialogue</li> <li>○ in a written text consisting of at least six sentences</li> </ul> </li> <li>• Based on learning situations on familiar themes</li> <li>• Using reference materials</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Understand the meaning of an oral message.	<ul style="list-style-type: none"> <li>• Accurate identification of words and idiomatic expressions</li> <li>• Clear recognition of the general meaning of simple messages</li> <li>• Logical connection between the various elements of the message</li> </ul>
2. Understand the meaning of a written message.	<ul style="list-style-type: none"> <li>• Accurate identification of words and idiomatic expressions</li> <li>• Clear recognition of the general meaning of simple messages</li> <li>• Logical connection between the various elements of the message</li> </ul>
3. Express a simple message orally.	<ul style="list-style-type: none"> <li>• Appropriate use of language structures in main and coordinate clauses</li> <li>• Appropriate application of grammar rules</li> <li>• Use of verbs in the present indicative</li> <li>• Appropriate use of basic vocabulary and idiomatic expressions</li> <li>• Clear pronunciation</li> <li>• Coherent sequencing of simple sentences</li> <li>• Spontaneous and coherent sequencing of sentences in a conversation</li> </ul>
4. Write a text on a given subject.	<ul style="list-style-type: none"> <li>• Appropriate use of language structures in main and coordinate clauses</li> <li>• Appropriate application of basic grammar rules</li> <li>• Use of verbs in the present indicative</li> <li>• Appropriate use of basic vocabulary and idiomatic expressions</li> <li>• Coherent sequencing of simple sentences</li> <li>• Acceptable application of graphic rules for writing systems that do not use the Latin alphabet</li> </ul>

**Learning Activities**

Periods of instruction: 45

Credits: 2

Note: The acquisition of a modern language requires an awareness of the culture of its native speakers.  
“Limited skill” refers to the limited use of language structures, grammar and vocabulary. This limitation varies depending on the complexity of the modern language.  
Use the 600 series of codes to link a course to objective 000Z, with the exception of codes 601, 602, 603 and 604.

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Communicate on familiar topics in a modern language.	<ul style="list-style-type: none"> <li>• During a conversation that includes at least 15 lines of dialogue</li> <li>• In a written text consisting of at least 20 sentences for Latin-alphabet languages</li> <li>• In a written text consisting of at least 10 sentences for non-Latin-alphabet languages</li> <li>• Based on:               <ul style="list-style-type: none"> <li>○ common situations in everyday life</li> <li>○ simple topics from everyday life</li> </ul> </li> <li>• Using reference materials</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Understand the meaning of an oral message.	<ul style="list-style-type: none"> <li>• Accurate identification of words and idiomatic expressions</li> <li>• Clear recognition of the general meaning and essential ideas of messages of average complexity</li> <li>• Logical connection between the various elements of the message</li> </ul>
2. Understand the meaning of a written message.	<ul style="list-style-type: none"> <li>• Accurate identification of words and idiomatic expressions</li> <li>• Clear recognition of the general meaning and essential ideas of messages of average complexity</li> <li>• Logical connection between the various elements of the message</li> </ul>
3. Express a simple message orally, using sentences of average complexity.	<ul style="list-style-type: none"> <li>• Appropriate use of language structures in main or subordinate clauses</li> <li>• Appropriate application of grammar rules</li> <li>• Use of verbs in the present indicative</li> <li>• Appropriate use of enriched basic vocabulary and idiomatic expressions</li> <li>• Clear pronunciation</li> <li>• Coherent sequencing of sentences</li> <li>• Dialogue</li> </ul>
4. Write a text on a given subject, using sentences of average complexity.	<ul style="list-style-type: none"> <li>• Appropriate use of language structures in main or subordinate clauses</li> <li>• Appropriate application of grammar rules</li> <li>• Use of verbs in the present and past indicative</li> <li>• Appropriate use of enriched basic vocabulary and idiomatic expressions</li> <li>• Coherent sequencing of sentences of average complexity</li> <li>• Acceptable application of graphic rules for writing systems that do not use the Latin alphabet</li> </ul>

**Learning Activities**

Periods of instruction: 45

Credits: 2

Note: The acquisition of a modern language requires an awareness of the culture of its native speakers.  
Use the 600 series of codes to link a course to objective 0010, with the exception of codes 601, 602, 603 and 604.

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Communicate with relative ease in a modern language.	<ul style="list-style-type: none"> <li>• Working alone</li> <li>• During a conversation consisting of at least 20 lines of dialogue</li> <li>• In a written text of medium length (at least 25 sentences for Latin-alphabet languages and 15 sentences for other languages)</li> <li>• Given documents of a sociocultural nature</li> <li>• Using reference materials for the written text</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Understand the meaning of an oral message in everyday language.	<ul style="list-style-type: none"> <li>• Accurate explanation of the general meaning and essential ideas of the message</li> <li>• Clear identification of structural elements of the language</li> </ul>
2. Understand the meaning of a text of average complexity.	<ul style="list-style-type: none"> <li>• Accurate explanation of the general meaning and essential ideas of the text</li> <li>• Clear identification of structural elements of the language</li> </ul>
3. Have a conversation on a subject.	<ul style="list-style-type: none"> <li>• Appropriate use of the structural elements of the language according to the message to be expressed</li> <li>• Appropriate use of everyday vocabulary</li> <li>• Accurate pronunciation and intonation</li> <li>• Normal flow in a conversation in everyday language</li> <li>• Coherence of the message expressed</li> <li>• Pertinent responses to questions</li> </ul>
4. Write a text of average complexity.	<ul style="list-style-type: none"> <li>• Appropriate use of the structural elements of the language according to the text to be written</li> <li>• Accurate vocabulary</li> <li>• Coherence of the text as a whole</li> <li>• Observance of presentation and writing rules applicable to the text</li> </ul>
<b>Learning Activities</b>	
Periods of instruction:	45
Credits:	2
Note:	<p>The acquisition of a modern language requires an awareness of the culture of its native speakers.</p> <p>Use the 600 series of codes to link a course to objective 0067, with the exception of codes 601, 602, 603 and 604.</p>

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Recognize the role of mathematics or computer science in contemporary society.	<ul style="list-style-type: none"> <li>• Working alone</li> <li>• In an essay of approximately 750 words</li> <li>• Using different personally selected concrete examples</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Demonstrate the acquisition of basic general knowledge of mathematics or computer science.	<ul style="list-style-type: none"> <li>• Identification of basic notions and concepts</li> <li>• Identification of the main branches of mathematics or computer science</li> <li>• Appropriate use of terminology</li> </ul>
2. Describe the evolution of mathematics or computer science.	<ul style="list-style-type: none"> <li>• Descriptive summary of several major phases</li> </ul>
3. Recognize the contribution of mathematics or computer science to the development of other areas of knowledge.	<ul style="list-style-type: none"> <li>• Demonstration of the existence of important contributions, using concrete examples</li> </ul>
4. Illustrate the diversity of mathematical or computer science applications.	<ul style="list-style-type: none"> <li>• Presentation of a range of applications in various areas of human activity, using concrete examples</li> </ul>
5. Evaluate the impact of mathematics or computer science on individuals and organizations.	<ul style="list-style-type: none"> <li>• Identification of several major influences</li> <li>• Explanation of the way in which mathematics or computer science have changed certain human and organizational realities</li> <li>• Recognition of the advantages and disadvantages of these influences</li> </ul>
<b>Learning Activities</b>	
Periods of instruction:	45
Credits:	2
Note:	<p>Only the following codes can be used to link a course to objective 0011: 105, 201, 204, 420.</p> <p>Use code 204 for a multidisciplinary course.</p> <p>Codes 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.</p>

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Use various mathematical or computer science concepts, procedures and tools for common tasks.	<ul style="list-style-type: none"> <li>• Working alone</li> <li>• While carrying out a task or solving a problem based on everyday needs</li> <li>• Using familiar tools and reference materials</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Demonstrate the acquisition of basic functional knowledge in mathematics or computer science.	<ul style="list-style-type: none"> <li>• Brief definition of concepts</li> <li>• Correct execution of basic operations</li> <li>• Appropriate use of terminology</li> </ul>
2. Select mathematical or computing tools and procedures on the basis of specific needs.	<ul style="list-style-type: none"> <li>• Listing of numerous possibilities available through the use of mathematical and computing tools and procedures</li> <li>• Analysis of concrete situations and recognition of the usefulness of mathematical or computing tools and procedures</li> <li>• Appropriate choice according to needs</li> </ul>
3. Use mathematical or computing tools and procedures to carry out tasks and solve problems.	<ul style="list-style-type: none"> <li>• Use of a planned and methodical process</li> <li>• Correct use of tools and procedures</li> <li>• Satisfactory results, given the context</li> <li>• Appropriate use of terminology specific to a tool or procedure</li> </ul>
4. Interpret the quantitative data or results obtained using mathematical or computing tools and procedures.	<ul style="list-style-type: none"> <li>• Accurate interpretation, given the context</li> <li>• Clear, precise formulation of the interpretation</li> </ul>
<b>Learning Activities</b>	
Periods of instruction:	45
Credits:	2
Note:	<p>Only the following codes can be used to link a course to objective 0012: 105, 201, 204 and 420.</p> <p>Use code 204 for a multidisciplinary course.</p> <p>Codes 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.</p>

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Consider various forms of art produced according to aesthetic practices.	<ul style="list-style-type: none"> <li>• Working alone</li> <li>• Given a specified work of art</li> <li>• In a written commentary of approximately 750 words</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Develop an appreciation for the dynamics of the imagination in art.	<ul style="list-style-type: none"> <li>• Precise explanation of a creative process connected to the construction of an imaginary universe</li> </ul>
2. Describe art movements.	<ul style="list-style-type: none"> <li>• Descriptive list of the main characteristics of three art movements from different eras, including a modern movement</li> </ul>
3. Give a commentary on a work of art.	<ul style="list-style-type: none"> <li>• Coherent organization of observations, including identification of four fundamental elements of form and structure related to the language used as well as a reasoned description of the meaning of the work of art</li> </ul>
<b>Learning Activities</b>	
Periods of instruction:	45
Credits:	2
Note:	Use the 500 series of codes (except 502) to link a course to objective 0013. Use code 504 for a multidisciplinary course. Codes 340, 345, 601, 602, 603 and 604 may be used, provided the courses are not related to the objectives of common or specific general education.

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Produce a work of art.	<ul style="list-style-type: none"> <li>• Working alone</li> <li>• During a practical exercise</li> <li>• In the context of creating or interpreting a work of art</li> <li>• Using the basic elements of the language and techniques specific to the medium selected</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Recognize the primary forms of expression of an artistic medium.	<ul style="list-style-type: none"> <li>• Identification of specific features: originality, essential qualities, means of communication, styles, genres</li> </ul>
2. Use the medium.	<ul style="list-style-type: none"> <li>• Personal, coherent use of elements of language</li> <li>• Satisfactory application of artistic techniques</li> <li>• Compliance with the requirements of the method of production</li> </ul>
<b>Learning Activities</b>	
Periods of instruction:	45
Credits:	2
Note:	<p>Use the 500 series of codes to link a course to objective 0014, with the exception of code 502.</p> <p>Use code 504 for a multidisciplinary course.</p> <p>Codes 340, 345, 601, 602, 603 and 604 may be used, provided the courses are not related to the objectives of common or specific general education.</p>

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Consider contemporary issues from a transdisciplinary perspective.	<ul style="list-style-type: none"> <li>• Individually or in groups</li> <li>• Drawing on different fields of knowledge</li> <li>• Using documents and data from various disciplines</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Identify major contemporary issues.	<ul style="list-style-type: none"> <li>• Exploration of various contemporary issues</li> <li>• Description of the main perspectives concerning these issues</li> <li>• Clear formulation of objects to study related to these issues</li> </ul>
2. Recognize the specific role of several disciplines in the understanding of an issue.	<ul style="list-style-type: none"> <li>• Identification of some of the theories used in analyzing the issue</li> <li>• Clear description of the concepts and methods used</li> </ul>
3. Demonstrate the contribution of several disciplines to the understanding of an issue.	<ul style="list-style-type: none"> <li>• Clear formulation of the perspectives of the issue</li> <li>• Precise description of the main contributions of the disciplines</li> <li>• Pertinent explanation of the interaction among various disciplines</li> <li>• Appropriate use of language and concepts from the disciplines</li> </ul>
<b>Learning Activities</b>	
Periods of instruction:	45
Credits:	2
Note:	This objective lends itself to teaching by one or more teachers. Use code 365 to link a course to objective 021L in order to maintain the transdisciplinary nature of the competency.

**Objective****Standard**

<b>Statement of the Competency</b>	<b>Achievement Context</b>
Explore a contemporary issue from a transdisciplinary perspective.	<ul style="list-style-type: none"> <li>• Individually or in groups</li> <li>• Drawing on different fields of knowledge</li> <li>• Using documents and data from various disciplines</li> </ul>
<b>Elements of the Competency</b>	<b>Performance Criteria</b>
1. Present a research problem.	<ul style="list-style-type: none"> <li>• Justification of the choice of research problem</li> <li>• Brief description of the main issues involved in the problem</li> <li>• Clear formulation of the main dimensions of the problem</li> <li>• Appropriate use of language and concepts from the disciplines</li> <li>• Clear formulation of the research question</li> </ul>
2. Analyze the research problem.	<ul style="list-style-type: none"> <li>• Relevant description of a research approach or method</li> <li>• Appropriate selection of research data</li> <li>• Proper application of the approach or method used</li> <li>• Appropriate use of an analytical framework</li> </ul>
3. Propose solutions.	<ul style="list-style-type: none"> <li>• Clear description of the main contributions from the disciplines</li> <li>• Pertinent explanation of the interaction among various disciplines</li> <li>• Justification of solutions proposed</li> <li>• Assessment of the strengths and weaknesses of the proposed solutions</li> </ul>
<b>Learning Activities</b>	
Periods of instruction:	45
Credits:	2
Note:	This objective lends itself to teaching by one or more teachers. Use code 365 to link a course to objective 021M in order to maintain the transdisciplinary nature of the competency.

## Additional Information

### Key Terms Used in Pre-University Programs

#### Program

A program is an integrated set of learning activities leading to the achievement of educational objectives based on set standards.

#### Aim

The aim encompasses all of the academic fields identified in a pre-university program in order to prepare students for university. As a whole, the elements of a program—i.e. the aims of college education, common competencies, goals, objectives and standards—help students meet the educational requirements of these academic fields.

#### Goals

The goals of a pre-university program highlight what the students should learn. Program goals contribute to program coherence, which in turn promotes the integration and transfer of learning. They are in keeping with the program-based approach in that they serve to harmonize the program-specific and the general education components, and give concrete expression to the aim of the program.

#### Competency

A competency is the ability to act. It includes knowledge, skills and attitudes and refers to the student's demonstrated ability to use his or her knowledge and skills in a given situation.

#### Objectives

The objectives of pre-university programs determine the results expected of the students. It is by attaining objectives and meeting set standards that the students master the college-level competencies that are deemed essential to successful university studies. In pre-university programs, each objective is formulated in terms of a statement of the competency and its elements.

#### Standard

A standard is the level of performance at which an objective is considered to be achieved. It is by attaining objectives and meeting the required standards that the students master the college-level competencies that are deemed essential to successful university studies. In pre-university programs, each standard is formulated in terms of performance criteria.

#### Statement of the competency

The statement of the competency specifies the overall training objective associated with a competency; it is based on expectations identified in an analysis of university education and general education needs.

#### Elements of the competency

The elements specify the essential components of a competency. They include only what is necessary in order to understand and develop the competency.

## Performance criteria

The performance criteria define the requirements for recognition of attainment of a standard. They are not an evaluation framework *per se*, but may serve to develop one. Performance criteria must be taken into account in the evaluation of competency development.

## Learning activities

The aspects of learning activities that the Minister can determine, in whole or in part, in a pre-university program include: the field of studies, the discipline(s), the course weighting, the number of periods of instruction, the number of credits, and such specific indications as are deemed essential.

## Common objectives and standards

Common objectives and standards determine the core learning content for pursuing university studies in a given field, no matter what specialization a student may have taken.

## Objectives and standards of an option

The objectives and standards of an option expose students to an academic field in order to guide them in their university course selection.

## Optional objectives and standards

Optional objectives and standards may or may not be implemented by a college. They serve to develop learning activities based on local orientations.

## Harmonization of Pre-University Programs and General Education

The harmonization of pre-university programs and general education is part of a lifelong learning approach that makes it easier for college-level students to switch from one pre-university program to another without having to repeat activities for which they have already obtained credit. Additional information on the harmonization of pre-university programs and general education is available on the Ministère's Web site at:

[www.education.gouv.qc.ca/en/colleges/etudiants-au-collegial/pre-university-programs](http://www.education.gouv.qc.ca/en/colleges/etudiants-au-collegial/pre-university-programs).



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