

COMPUTER SCIENCE AND MATHEMATICS

Pre-University Program 200.CO



COMPUTER SCIENCE AND MATHEMATICS

Pre-University Program 200.CO



Identification du programme

Titre du programme : Sciences informatiques et mathématiques
Programme expérimental

Numéro du programme : 200.C0

Type de sanction : Diplôme d'études collégiales

Conditions particulières d'admission : Mathématique 536
Physique 534
Chimie 534

Nombre d'unités : 58 ^{2/3}

— formation générale : 26 ^{2/3}

— formation spécifique : 32

Nombre d'heures-contact totales : 1 560

— formation générale : 660

— formation spécifique : 900

Champ d'études : Sciences informatiques et mathématiques
Il comprend les disciplines informatique, mathématique, chimie, physique.

Recommandations


Sous-ministre adjointe

26 Sept 08
Date



Sous-ministre
pour MICHEL BOIVIN

2008.10.01
Date

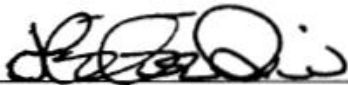
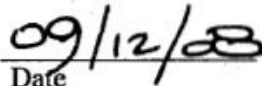
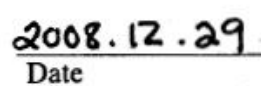
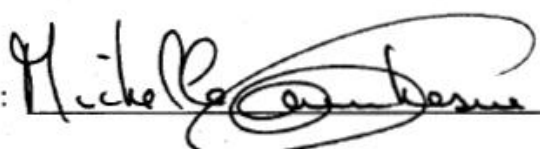
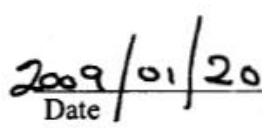
Approbation de la ministre



2008-10-07
Date

Identification of the program		
Program title	:	Computer Science and Mathematics Experimental Program
Program code	:	200.C0
Type of certification	:	Diploma of College Studies
Prerequisites	:	Mathematics 536 Physics 534 Chemistry 534
Number of credits	:	58 ^{2/3}
— General education component	:	26 ^{2/3}
— Program-specific component	:	32
Total hours of instruction	:	1 560
— General education component	:	660
— Program-specific component	:	900
Field of study	:	Computer Science and Mathematics It includes the disciplines of computer science, mathematics, chemistry and physics.
Recommendations	_____	_____
	Assistant-Deputy Minister	Date
	_____	_____
	Deputy Minister	Date
Approval of the Minister	_____	_____
		Date

**Décision relative à la modification
des conditions particulières d'admission
pour certains programmes d'études préuniversitaires**

Type de sanction :	Diplômes d'études collégiales
Modifications proposées :	Modifier, pour les programmes concernés, les conditions particulières d'admission pour celles apparaissant à l'annexe.
Session et année d'entrée en vigueur :	Automne 2010
APPROBATION DES PROGRAMMES	
Recommandations :	
 Sous-ministre adjointe Enseignement supérieur	 Date
 Sous-ministre	 Date
Approbation de la ministre :	 Date 

Annexe

NOUVELLES CONDITIONS PARTICULIÈRES D'ADMISSION POUR LES PROGRAMMES D'ÉTUDES PRÉUNIVERSITAIRES À COMPTER DE L'AUTOMNE 2010

No	Titre du programme	Préalable actuel	Préalable A-2010
La légende au bas de la liste donne la signification des abréviations			
200.B0	Sciences de la nature	Mathématique 536 Physique 534 Chimie 534	TS ou SN 5 ^e Physique 5 ^e Chimie 5 ^e
200.C0	Sciences informatiques et mathématiques	Mathématique 536 Physique 534 Chimie 534	TS ou SN 5 ^e Physique 5 ^e Chimie 5 ^e
300.A0	Sciences humaines	Mathématique 526 ou Mathématique 536 (pour les objectifs 022X, 022Y et 022Z)	TS ou SN 5 ^e (pour les objectifs 022X, 022Y et 022Z)
501.A0	Musique	Musique 534	Musique 5 ^e
700.A0	Sciences, lettres et arts	Mathématique 536 Physique 534 Chimie 534	TS ou SN 5 ^e Physique 5 ^e Chimie 5 ^e
700.B0	Histoire et civilisation	Mathématique 526 ou Mathématique 536 (pour les objectifs 022X, 022Y et 022Z)	TS ou SN 5 ^e (pour les objectifs 022X, 022Y et 022Z)

Signification des abréviations des nouveaux cours préalables

Mathématique

TS 5^e Mathématique, séquence Technico-sciences de la 5^e secondaire (064506)

SN 5^e Mathématique, séquence Sciences naturelles de la 5^e secondaire (065506)

Science et technologie

Chimie 5^e Chimie de la 5^e secondaire (051504)

Physique 5^e Physique de la 5^e secondaire (053504)

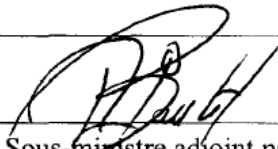
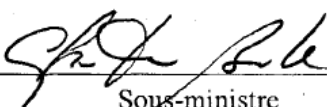
Arts

Musique 5^e Musique, formation obligatoire de la 5^e secondaire (169502)



**Ministère de l'Éducation,
du Loisir et du Sport**

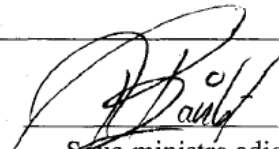
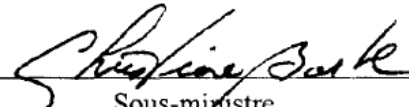
**Décision relative à la modification
d'un programme d'études préuniversitaires**

IDENTIFICATION DU PROGRAMME	
Titre et numéro du programme :	Sciences informatiques et mathématiques (200.C0)
Type de sanction :	Diplôme d'études collégiales
Nombre total d'unités allouées pour le programme :	58 ^{2/3}
Nombre d'heures-contact allouées pour le programme :	1 560
Modifications proposées :	
▪ Modifications mineures apportées à l'objectif 020Y; ▪ Modifications mineures apportées à l'objectif 020Z.	
Session et année d'entrée en vigueur :	Automne 2010
APPROBATION	
Recommandations :	 Sous-ministre adjoint par intérim Enseignement supérieur <u>06/06/10</u> Date
	 Sous-ministre <u>2010-06-08</u> Date
Approbation de la ministre :	 Ministre <u>2010/06/11</u> Date



**Ministère de l'Éducation,
du Loisir et du Sport**

**Décision relative à la modification
d'un programme d'études préuniversitaires**

IDENTIFICATION DU PROGRAMME	
Titre et numéro du programme :	Sciences informatiques et mathématiques (200.C0)
Type de sanction :	Diplôme d'études collégiales
Nombre total d'unités allouées pour le programme :	58 ^{2/3}
Nombre d'heures-contact allouées pour le programme :	1 560
Modifications proposées :	
▪ Modifications mineures apportées à l'objectif 020W; ▪ Modifications mineures apportées à l'objectif 020X.	
Session et année d'entrée en vigueur :	Automne 2010
APPROBATION	
Recommandations :	 Sous-ministre adjoint par intérim Enseignement supérieur <u>04/06/10</u> Date
	 Sous-ministre <u>2010-06-07</u> Date
Approbation de la ministre :	 Ministre <u>2010/07/27</u> Date

**Décision relative à la modification
d'un programme d'études préuniversitaires**

IDENTIFICATION DU PROGRAMME D'ÉTUDES

Titre du programme : Sciences informatiques et mathématiques

Numéro du programme : 200.C0

Type de sanction : Diplôme d'études collégiales

Nombre d'unités : 58 2/3

Nombre d'heures-contact : 1 560

Modifications proposées :

- Modifications mineures apportées à l'objectif 020V.

Session et année d'entrée en vigueur : Automne 2011

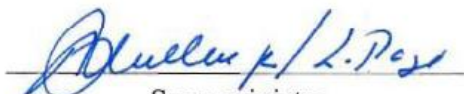
APPROBATION

Recommandations :


Sous-ministre adjointe
Enseignement supérieur

22-06-2011

Date


Sous-ministre

2011-06-30

Date

Approbation de la ministre :



2011-07-12

Date

Éducation,
Loisir et Sport

Québec 

Acknowledgments

The development of the *Computer Science and Mathematics* program was made possible by the generous cooperation of colleges and universities.

The Direction de l'enseignement collégial would like to thank the members of the Advisory Committee for the experimentation in *Computer Science and Mathematics* for their part in developing this program. Many people — academic deans, teachers, university representatives — have participated in the work of this committee over the past few years.

Members of the Advisory Committee for Experimentation:

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Julie Plante, mathematics teacher, Vanier College

Martin Robillard, assistant professor, School of Computer Science, McGill University

Monette Tremblay, academic dean, Collège Lionel Groulx

Harmonization

The harmonization of pre-university programs and general education at the college level 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.

The harmonization of pre-university programs and general education at the college level can be consulted on the ministère de l'Éducation, du Loisir et du Sport Web site at:

<http://www.mels.gouv.qc.ca/sections/publications/index.asp?page=fiche&id=1219>

Special Conditions Established by the Minister for Admission

Secondary V Mathematics: Technical and Scientific Option or Science Option

Secondary V Chemistry

Secondary V Physics

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Introduction to the Program

The *Computer Science and Mathematics* program is a pre-university program designed for those who wish to explore computer science and mathematics, in addition to science, and to acquire the fundamental learning and skills that such studies provide. Combining the scientific and technological approaches, it implements learning strategies that promote the establishment of connections between these fields. It also emphasizes everyone's ability to master their own learning process and to develop their autonomy, as well as their ability for formal analysis and rigorous reasoning in different situations. The program fosters the acquisition of rigorous scientific literacy, giving students the background required for university programs in the fields of engineering, computer science, science and mathematics.

This program was designed in keeping with the commitments made to the universities in the early stages of field testing and in accordance with the framework for the development of pre-university programs of the Direction de l'enseignement collégial. This framework:

- harmonizes pre-university programs with university-level programs;
- encourages the program approach;
- fosters a type of education centred on mastery of learning, using an approach based on objectives and standards;
- fosters a type of education that contributes to the overall development of the person.

This framework requires participation by partners from the colleges and universities for program development. Indeed, the development of pre-university programs in terms of objectives and standards is carried out with the cooperation of university representatives and academic deans and teachers in colleges.

The *Computer Science and Mathematics* program includes a component of general education that is common to all college programs (16 2/3 credits), a component of general education that is specific to the program (6 credits), a component of general education that is complementary to its other components (4 credits) and a specific program component (32 credits).

This document has two parts. The first part presents an overview of the program. The second part describes the objectives and standards for general education and specific education.

Vocabulary Used

Program

A program is an integrated set of learning activities leading to the achievement of educational objectives based on set standards (*College Education Regulations*, section 1).

Aim

The aim of pre-university programs is to prepare students for university through training emphasizing the integration of general and specific education and the transfer of learning. The aim must also reflect the requirements of an educational continuum oriented toward success in university.

General Goals

The general goals of pre-university programs guide the development of each program by indicating outcomes that should result in consistency, integration and the transfer of learning. By facilitating the coordination of the educational intent of general education with that of specific education, the general goals clarify the aim of the program, which is for the students to acquire skills essential for success in university.

Competencies

In pre-university education, competencies are based on knowledge, skills, attitudes and so on, whose acquisition or mastery is necessary for success in specific fields in university.

Objectives

The objectives of pre-university programs determine the results expected of the students. It is by attaining objectives and standards that the students acquire or master the competencies specific to the college level that are necessary to pursue university studies in particular fields.

When pre-university programs are developed and presented by the Ministère, each objective is formulated in terms of a competency and includes a statement of the competency and its elements.

Statement of the competency

The statement of the competency is the result of an analysis of the needs of general education and those of university education.

Elements

The elements of the objective, formulated in terms of a competency, specify its essential components. They include only what is necessary in order to understand and achieve the competency.

Standard

The standard is the level of performance at which an objective is considered to be achieved (*College Education Regulations*, section 1). It is by attaining objectives and standards that the students acquire or master the competencies specific to the college level that are necessary to pursue university studies in particular fields.

Performance criteria

The performance criteria define the requirements for recognition of the attainment of the objective. All the criteria must be respected for the objective to be attained.

Learning activities

The aspects of learning activities which the minister can determine in whole or in part are the field of studies, the discipline or disciplines, the course weighting, the number of contact hours, the number of course credits, and such specific indications as are deemed essential.

FIRST PART: OVERVIEW

Aim of the Program

The *Computer Science and Mathematics* college 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.

General Goals of the Program

The general goals of the program are to enable students to do the following:

- to situate and connect the characteristics of the subjects studied;
- to assimilate concepts and work methods required to study subjects in various fields of knowledge;
- to use information and communications technologies (ICT) to solve problems in a scientific context;
- to communicate clearly and correctly;
- to take charge of their own personal and social development;
- to work as a member of a team.

Each college determines the ways in which the general goals of the program are taken into consideration. Moreover, each course may contribute to the full or partial attainment of one or more of these goals. What is important is that all the goals be represented in one or more courses, and that they become specific focuses of teaching and learning, because they are recognized as essential to university studies and the Diploma of College Studies in *Computer Science and Mathematics* must attest to their achievement.

Explanation of the General Goals of the Program

Each general goal is explained as follows:

To 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 adapted to the specific program.

To 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.

To 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 general 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.

To 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.

To 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.

To 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 in College Programs

In Quebec, college is the next stage after the compulsory years of schooling (elementary and secondary school). College graduates enter the labour market directly or progress to university. The foundations on which their programs of study are based are established by the Minister of Education, Recreation and Sports which is also responsible for drawing up and implementing these programs. Individual colleges ensure the implementation of the programs and determine learning activities to achieve the outcomes articulated in the standards.

The college program constitutes the frame of reference within which the students choose to learn a profession or pursue their studies by acquiring designated competencies. For the teachers, the program outlines the learning outcomes and circumscribes the range of pedagogical intervention.

Programs of studies leading to the Diploma of College Studies (DCS) include two main components: the general education component and a specific program component. General education is an integral part of each program and, when coupled with the specific program component as part of an integrated approach, fosters the development of competencies required by the whole program.

Educational Aims

Three educational aims define the general education component of the programs. They are:

- Educate the individual to live responsibly within society.
- Help the individual integrate cultural knowledge into their studies.
- Help the individual to master language as a tool for thought, communication and openness to the world.

These three general education aims are an integral part of a college education and contribute in a particular fashion to its actualization. They involve the specific program components and contribute to the consistency of the program as a whole. By enhancing the complementary nature of the general and specific components, the aims contribute to the coherence of the programs in regard to their educational intentions and the objectives of a quality education.

Contribution of the General Education Component to the Students' Program of Studies

The general education component contributes to the development of 12 competencies, which are in turn associated with 3 broader educational aims, and are described in the profile entitled *Contribution of the General Education Component to the Students' Program of Studies*. These competencies set out desired student outcomes in general education.

The general education profile illustrates both the specific and complementary nature of the general education disciplines, which are:

- French, Language of Instruction and Literature.
- English, Language of Instruction and Literature.
- Philosophy.
- Humanities.
- French as a Second Language.
- English as a Second Language.
- Physical Education.

Competencies in the General Education Profile

The 12 competencies in the general education profile guide teaching practices and represent the common and complementary learning outcomes of the disciplines in the general education component.

Seen in relation to the educational aims, the 12 competencies in the profile are incorporated into learning and evaluation activities, which attest to their acquisition. The contribution of each discipline manifests itself in varying degrees in the objectives and standards.

Competencies common to college education as a whole

For information purposes, the Minister has identified five basic common competencies that it hopes to see associated with the educational aims:

- Solve problems.
- Use creativity.
- Adapt to new situations.
- Exercise sense of responsibility.
- Communicate.

If necessary, this list will be completed by pre-university program advisory committees and college program committees.

General Education Profile

Contribution of the General Education Component to the Students' Program of Studies

Educational aims	The general education component leads students to:
Live responsibly within 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.
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 or other artistic expressions emanating from different historical periods and movements.
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.
For information purposes, the Minister has identified five basic common competencies, which it hopes to see associated with the educational aims; • Solve problems. • Use creativity. • Adapt to new situations. • Exercise sense of responsibility. • Communicate.	

Contribution of the disciplines of general education to the promotion and improvement of the mastery of the language of instruction

Each discipline of general education must contribute to the improvement of the students' oral and written communication skills in the language of instruction and also foster the development of revision and correction strategies, especially in the case of the written word. This contribution is described in the goals of each discipline and is explained in detail in the objectives and standards of each discipline.

In this context, the teacher's role is to:

- propose pedagogical activities to promote the language of instruction.
- create an auspicious environment for reading and writing.
- provide students with work methods and various tasks that will allow them to improve their oral and writing skills.

Goals of each discipline

The goals specify how each discipline contributes to the development of the profile's competencies and to the achievement of the objectives and standards of general education. These goals are presented under four headings:

- The main characteristics describe certain particularities of the discipline.
- The principles introduce the basic premises underlying the teaching of this discipline.
- The expected outcomes specify the most meaningful learning situations that lead students to develop the competencies contained in the Profile and to achieve the objectives and reach the standards of general education. These expected outcomes are presented in the form of knowledge, skills and attitudes.
- The sequence of objectives and standards highlights the progression in learning activities in terms of their coherence.

Components of General Education

The general and specific education components both contribute to the students' education. As such, the knowledge, skills and attitudes transmitted in one component are developed and, whenever possible, applied in the other. While respecting the educational aims and the goals of each discipline, as well as the ministerial objectives and standards, each college-level institution shapes the general education component with learning activities that are consistent with its educational project and success plan.

The general education component includes:

- General education common to all programs is allotted 16 2/3 credits distributed as follows:
 - Language of Instruction and Literature: 7 1/3 credits.
 - Philosophy or Humanities: 4 1/3 credits.
 - Physical Education: 3 credits.
 - Second Language: 2 credits.
- General education specific to each program introduces tasks or learning situations that are relevant to the field of study, and promotes their re-use in the program-specific component. The breakdown of credits, for a total of 6, is as follows:
 - Language of Instruction and Literature: 2 credits.
 - Philosophy or Humanities: 2 credits.
 - Second Language: 2 credits.
- Complementary general education allows students to complete their program of study with learning activities that promote balance and complementarity by exposing them to fields outside the program-specific component. Students may choose courses for a total of 4 credits in the following areas:
 - Social Sciences.
 - Science and Technology.
 - Modern Language.
 - Mathematics Literacy and Computer Science.
 - Art and Aesthetics.
 - Contemporary Issues.

Goals of the Disciplines of Common and Specific General Education

English, Language of Instruction and Literature

Main Characteristics

Building on the skills developed by students on completion of secondary school, the English, Language of Instruction and Literature program places a marked emphasis on written production, reading comprehension and literary analysis, while at the same time consolidating listening and speaking skills.

In addition to the skills developed in language use and literary analysis, students will develop skills and attitudes appropriate to the goals of college-level general education. They will develop: independent, critical and logical thinking; self-reflective and ethical practice in their learning and actions; an understanding of the roles of diverse media within the culture of a society; the ability to analyze works in the humanities from different periods and movements; the ability to use the appropriate rules governing argument and other forms of discourse; an appreciation of literature and other artistic works of different periods.

Principles

In English, Language of Instruction and Literature (Common to All Programs), the mastery of language skills will be achieved through regular and ongoing observance of the rules of correct writing and speaking, and the production of texts supported by the reading and study of literature. Students will also be encouraged to develop an appreciation of literature by becoming acquainted with a number of significant literary works representative of various genres and periods, and by expressing a variety of literary themes. Both the aesthetic and cultural value of these texts and their formal aspects will be the objects of study.

In English, Language of Instruction and Literature (Specific to Each Program) students will learn to communicate in the forms of discourse appropriate to one or more fields of study.

Expected Outcomes

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

- will be able to demonstrate their knowledge of:
 - the basic vocabulary and terminology used when discussing literary works.
 - ways to apply an independent critical approach to literary genres.
 - ways to apply an independent critical approach to literary themes.

- the appreciation of literary and non-literary works or other artistic expressions emanating from different historical periods and movements.
- ways to analyze the humanities emanating from different historical periods and movements.
- ways to refine oral and written communication in the language of instruction.
- will be able to demonstrate their ability to:
 - 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 forms of discourse.
 - communicate in forms of discourse appropriate to one or more fields of study.
- will be encouraged to develop their attitudes of:
 - 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.
 - independent, critical and ethical thought.

Sequence of Objectives and Standards

The three sets of objectives and standards in English, Language of Instruction and Literature Common to All Programs, pursue two general goals: mastery of the language of instruction and exploration of the riches of the literary heritage. Achievement of these goals is intended to bring the students to a college level of proficiency in the areas of reading, writing, listening and speaking. All students entering college will begin their English studies with an introductory set of objectives and standards. This set has two possible formats. While both formats provide a range of reading, writing, and literary activities, one includes additional reinforcement of reading and writing skills.

The set of objectives and standards for English, Language of Instruction and Literature Specific to Each Program, is placed in the context of general education and is a complement to the general education common to all programs. Students will develop the skills required in order to communicate in the forms of discourse appropriate to one or more fields of study.

Humanities

Main Characteristics

Humanities, as part of the general education component, is intended to promote personal and social development and to give students a foundation that will help them understand their roles in contemporary society as members of the work force, citizens and individuals. The three sets of objectives and standards in humanities propose common frameworks for understanding the experiences, ideas and values of humankind and their diversity. They are aimed at developing critical thinking, reinforcing the ancillary skills involved in careful reading, organized writing, and well-developed oral presentations, and, where appropriate, improving media and computer literacy. Once students have mastered the three-stage process of analysis, synthesis and evaluation, they will be able to reflect in an informed manner and to communicate what they have learned in an organized and coherent fashion.

Principles

- Humanities constitutes a thematic, multidisciplinary and, at times, transdisciplinary exploration of humankind, including its accomplishments, failures, abilities, creations, ideas and values.
- Humanities helps students to recognize, define and classify information and provides them with common frameworks. These frameworks offer methods of analyzing, synthesizing and evaluating conceptions of society, knowledge and values.
- Humanities aims to prepare students for common civic responsibilities and the exercise of rights.
- Humanities pursues the general goal of developing critical thought, valuing it and recognizing its limitations.

Expected Outcomes

Students who have achieved the general education objectives in humanities

- will be able to demonstrate their knowledge of:
 - 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 ideas formulation, reformulation, synthesis.
 - the importance and practice of adequately substantiated argumentation, written and oral.

- will be able to demonstrate their ability to:
 - 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.
 - demonstrate familiarity with original thought and creativity.
 - 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 their attitudes of:
 - 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 tolerance towards others.
 - concern for planetary issues.
 - determination to continue learning.

Sequence of Objectives and Standards

The first two sets of objectives and standards in humanities, which are part of the general education component common to all programs, develop similar skills in a recursive fashion.

The emphasis in the first set, is on how knowledge is defined, acquired, classified, transmitted and applied. Students examine both messages and media to identify the strengths and limitations of each. They learn to situate knowledge in a social, historical and personal context, a skill they will need in order to become lifelong learners.

The focus in the second set is on how individuals, groups, societies or nations organize ideas, perceptions and values into explanatory patterns. Students explore major ideas and value systems by which diverse individuals, groups, societies or nations seek to explain the world and their place in it.

The third set, which is part of the general education component specific to each program, is aimed at deepening and reinforcing the critical thinking skills developed in the first two sets. It is, therefore, sequenced so that students can build on the critical skills, knowledge and insights developed in the first two sets. By situating these issues in their appropriate worldview and knowledge contexts, students develop a critical and autonomous approach to ethical values in general and to the values involved in their own fields of interest in particular. This final set also provides students with an opportunity to consolidate personal and social values.

Français, langue seconde

Objet de la discipline

L'enseignement du français, langue seconde, a pour objet de permettre à l'élève de communiquer efficacement en français avec ses concitoyens et ses concitoyennes. Il contribue ainsi à lui permettre de comprendre et de partager les acquis culturels et sociaux, ainsi que d'en discuter.

Principes

En tant que partie intégrante de la formation générale, le français, langue seconde, contribue à développer l'autonomie ainsi que la pensée critique et rationnelle. Il prépare les élèves à s'ouvrir au monde et à assumer leurs responsabilités sociales.

La maîtrise du français, langue seconde, est essentielle pour quiconque veut participer pleinement à la vie et à la culture de la société québécoise, dont le français est la langue officielle. Par conséquent, la formation générale en français, langue seconde, a pour finalité de rendre les élèves aptes à communiquer de façon efficace dans la société et à apprécier les éléments constitutifs de la culture québécoise (tels la littérature, les médias, les arts, la technologie, les codes sociaux, etc.).

À leur arrivée au collégial, les élèves ont déjà acquis des compétences dans les quatre habiletés langagières, à savoir : parler, lire, écouter et écrire, mais sont, de façon générale, plus compétents à l'oral. En conséquence, la formation porte surtout sur le développement de la maîtrise de la lecture et de l'écriture. Celle des règles de base du discours et de l'argumentation s'inscrit dans cette visée. Les élèves peuvent ainsi prendre conscience des moyens d'expression particuliers au français, langue seconde, et indirectement à l'anglais, langue d'enseignement.

Résultats attendus

Tout élève qui a atteint les objectifs et standards de la formation générale en français, langue seconde, peut rendre compte,

- sur le plan des connaissances :
 - de différentes techniques de lecture,
 - des éléments formels nécessaires à l'élaboration d'un texte structuré, tant à l'oral qu'à l'écrit,
 - de différentes formes du discours et de leurs usages spécifiques;
- sur le plan des habiletés :
 - de sa capacité de questionner, d'analyser, de juger et d'argumenter en français,
 - de sa capacité à réfléchir sur ses savoirs et son agir, notamment par la révision de ses productions écrites,
 - de son aptitude à entretenir des rapports sociaux et à partager la vie culturelle du Québec,
 - de son aptitude à établir, à poursuivre et à pratiquer des rapports professionnels en français;

- sur le plan des attitudes :
 - de son ouverture aux différents aspects de la culture québécoise,
 - de sa reconnaissance de la créativité et de la valorisation de cette dernière,
 - de sa préparation à participer à la vie sociale et économique.

Séquence des objectifs et des standards

Pour répondre aux divers besoins d'apprentissage des élèves du collégial, l'enseignement du français, langue seconde, est réparti en quatre niveaux (ou ensembles). Chacun de ces niveaux permet de les amener à interpréter et à produire des textes de plus ou moins grande complexité. Par ailleurs, dans les niveaux avancés, les élèves apprécieront des œuvres littéraires, des textes ou d'autres productions artistiques et apprendront à exercer leur sens critique et leur sens de l'éthique.

La formation générale en français, langue seconde, comporte deux ensembles prévus en séquence. Le premier (bloc A), qui fait partie de la formation générale commune à tous les programmes d'études, a pour objet de consolider les connaissances linguistiques déjà acquises et de les développer pour amener les élèves à communiquer de façon plus rigoureuse.

Le second ensemble (bloc B), qui fait partie de la formation générale propre aux programmes d'études, s'appuie sur les acquis du premier ensemble en les enrichissant d'éléments de compétence liés aux champs d'études des élèves. On cherche ainsi à développer la précision de l'expression dans des situations de communication particulières à ces champs d'études.

French, Second Language

Main Characteristics

The aim of the French as a Second Language program is to enable students to communicate effectively in French with their fellow citizens. The program helps them to understand, share and discuss cultural and social knowledge.

Principles

As an integral part of general education, the French as a Second Language program helps develop autonomy as well as critical and rational thinking. It prepares students to be open to the world and to assume their social responsibilities.

Mastery of French as a Second Language is essential for anyone who wants to participate fully in the life and culture of Québec society, whose official language is French. Hence, the purpose of general education in French as a Second Language is to enable students to communicate effectively in society and to appreciate the main components of Québec culture (such as literature, the media, the arts, technology and social codes).

When they reach the college level, students have already acquired competencies in the four language skills, speaking, reading, listening and writing, but they are generally more competent in oral language. Therefore the program focuses on developing reading and writing skills. Mastery of the basic rules of discourse and argument is part of this aim. Students may thus become aware of means of expression used in French as a Second Language, and indirectly, in English, Language of Instruction.

Expected Outcomes

All students who have achieved the objectives of French as a Second Language in general education,

- will be able to demonstrate their knowledge of:
 - 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:
 - question, analyze, judge and argue in French.
 - reflect on their knowledge and actions notably by revising their written productions.
 - maintain social relationships and to share in the cultural life of Québec.
 - establish and maintain work-related relationships in French.
- will be encouraged to develop their attitudes of:
 - openness to the various aspects of Québec culture.
 - recognition and promotion of creativity.
 - readiness to participate in social and economic life.

Sequence of Objectives and Standards

To meet the varied learning needs of students at the college level, the French as a Second Language program is divided into four levels (or sets). At each level, students interpret and produce texts that are more or less complex. At the more advanced levels, they learn to appreciate literary works, texts or other artistic productions and to exercise critical and ethical judgment.

The French as a Second Language program in the general education component consists of two sets of objectives and standards designed to be used in sequence. The purpose of the first one (Block A), which is part of general education common to all programs, is to consolidate and develop previous language learning so as to enable students to communicate more accurately.

The second set (Block B), which is part of program-specific general education component, is based on the learning acquired in the first set, enriched with elements of competency related to the students' fields of study. The aim is to develop precision of expression in communication situations specific to these fields of study.

Physical Education

Main Characteristics

The primary aim of physical education at the college level is the development of the whole person. By pursuing the development of a healthy, active lifestyle, the physical education program encourages students to live responsibly within society, to show independence, creativity and respect for others through the regular and sufficient practice of physical activity.

Principles

The teaching of physical education enables students: to take charge of their health by committing to being physically active and by adopting responsible behaviour as part of a healthy active lifestyle; to practice a physical activity sufficiently and on a regular basis, namely, to extract the maximum health benefits in order to maintain or improve their level of physical fitness.

This teaching also enables students: to become aware of the factors that contribute to greater proficiency, motivation and perseverance in a physical activity; to apply an approach designed to enhance their skills depending on the physical activity settings; to recognize the influence physical activity has on their lifestyle and to improve their communication skills.

Expected Outcomes

Students who have achieved the physical education objectives in general education

- will be able to demonstrate their knowledge of:
 - 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 which can enhance their health and fitness.
 - the rules, techniques and conditions involved in different types of physical or sporting activity.
 - the main socio-cultural factors which influence the inclusion of physical activity in one's lifestyle.
- will be able to demonstrate their ability to:
 - 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 practicing 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, tactics 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 manner that emphasizes clear argumentation.
- will be encouraged to develop their attitudes of:
 - awareness of the importance of practicing a physical activity sufficiently and on a regular basis in order to improve their fitness.
 - awareness of the factors that encourage them to practice 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.

Sequence of Objectives and Standards

- At the college level, the three sets of objectives and standards in physical education carry on the development of a healthy, active lifestyle, begun in secondary school. Students will be encouraged to take measures required to maintain or improve lifelong fitness habits.
- The three sets of objectives and standards in physical education are incorporated into a learning sequence. The theoretical and practical knowledge acquired in the first two sets is applied in the third.
- The first set focuses on the relationship between health, physical fitness, and an active lifestyle. To be able to make a relevant and justified choice of physical activities, students try one or more activities and then relate them to their ability to adapt to effort, their need to change or maintain their fitness level, their motivation, lifestyle and knowledge regarding disease prevention.

- The purpose of the second set is to encourage students to use a goal-oriented approach to improve the effectiveness of a physical activity whether it is a sport, corporal expression or an outdoor activity. After an initial assessment, students evaluate the physical activity in terms of their ability and attitudes; they set goals and try an approach aimed at improving their motor skills, their technique or their mastery of complex strategies. Finally, students are called upon to assess their progress.
- The third set aims to encourage students to incorporate physical activity in their lifestyle to benefit their overall health and fitness level by teaching them to manage the factors that influence physical activity. During class hours, students apply the knowledge they acquired in the first two sets. Through sufficient and regular practice of a health-oriented physical activity, they plan, apply and evaluate a personal physical activity program. Students follow and validate their program under the teacher's supervision. The hours allotted for personal work enable students to do required course work, to practice their physical activity and develop a healthy lifestyle.

Presentation of the Subject Areas of Complementary General Education

Social Sciences

In the subject area of Social Sciences, students meet the two sets of objectives and standards by learning to view the social sciences as a specific approach to the study of human existence.

The first set of objectives and standards gives rise to learning activities designed to enable students to assess the contribution of one or more of the social sciences to our understanding of major contemporary issues: the focus of the social sciences, the contribution of the social sciences to an understanding of contemporary issues, future questions which the social sciences will be called upon to examine.

The second set of objectives and standards gives rise to learning activities designed to enable students to rigorously analyze one of the major problems of our time using one or more social scientific approaches.

Science and Technology

In the subject area of Science and Technology, the educational goal is to present science and technology as a specific approach to the study of reality, by introducing students to this area of knowledge. This general goal may cover various aspects of the field of knowledge, primarily experimentation with methodological instruments and the study of the evolution, challenges and consequences of scientific and technological discoveries.

The first set of objectives and standards emphasizes the general nature and scope of science and technology.

The second set emphasizes experimentation with the scientific method.

Modern Language

Students meet the three sets of objectives and standards for Modern Language by learning the basic structures and vocabulary of a third language, while developing an awareness for the culture of the people who speak this language.

Some modern languages use different structures and different writing systems. The three sets of objectives and standards have been developed to take this into account. The degree of competency acquired therefore varies, depending on how far removed these languages are from our own language structure and thought process. Awareness of the culture of the people who speak a modern language is not considered an element of the competency because learning a modern language necessitates awareness of the culture.

Mathematics Literacy and Computer Science

In the subject area of Mathematics Literacy and Computer Science, the two sets of objectives and standards are based on the educational goal of developing a mathematics and computer culture.

Students meet the first set of objectives and standards by studying the place, role and evolution of mathematics and computers in our society and by describing their different applications. This is a general approach to mathematics literacy and computer science and is not geared to providing students with specific training.

Students meet the second set of objectives and standards by developing their capacity to understand and use mathematics and computers in order to perform common tasks. More specifically, this set covers related concepts and tools and the general applications of mathematics and computers in everyday life.

The general approach to the objectives and standards makes it possible to define numerous learning activities intended to promote the development of a mathematics- or computer-based competency, or a combination of these two areas.

Art and Aesthetics

In Art and Aesthetics, the educational goal is to provide students with a general knowledge by exploring various forms of art, in one or more artistic fields. This basic education allows students to develop aesthetic awareness through exposure to works and experimentation with an artistic medium. In addition, students acquire the basic elements of artistic language and the ability to establish connections between the elements of this language.

Students meet the first set of objectives and standards by studying works of contemporary art and art from other eras. In so doing, they learn to develop an appreciation for the dynamics of the imagination in art and become familiar with the methods of analyzing works of art.

Students meet the second set of objectives and standards by undertaking creative or interpretative activities that involve using an artistic medium. Students also come into contact with works created through this medium so as to learn to recognize the main forms of expression.

Contemporary Issues

In the subject area Contemporary Issues, the two sets of objectives and standards involve current concerns that are cross-disciplinary. The concept of cross-disciplinarity does not reflect a degree of specialization, but rather a type of approach that addresses a contemporary issue from the perspective of various disciplines and areas of knowledge, while going beyond the mere juxtaposition of subjects studied.

The first set of objectives and standards gives rise to learning activities that allow students to identify major contemporary issues and demonstrate the contribution of various disciplines to the understanding of an issue through theories, concepts and analytical methods.

The second set involves dealing with a contemporary issue as a research problem. Students have to present and analyze the problem, propose solutions and justify those solutions.

List of Program Objectives

Common and Specific General Education

16 2/3 credits and 6 credits

English, Language of Instruction and Literature

- 4EA0 To analyze and produce various forms of discourse.
- 4EA1 To apply a critical approach to literary genres.
- 4EA2 To apply a critical approach to a literary theme.
- 4EAP To communicate in the forms of discourse appropriate to one or more fields of study.

Humanities

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

Français, langue seconde (French, Second Language)

- 4SF0 Appliquer les notions de base de la communication en français courant. (To apply basic concepts for communicating in standard French.)
or
- 4SF1 Communiquer en français courant avec une certaine aisance. (To communicate in standard French with some ease.)
or
- 4SF2 Communiquer avec aisance en français courant. (To communicate with ease in standard French.)
or
- 4SF3 Traiter d'un sujet culturel et littéraire. (To deal with a cultural and literary topic.)

4SFP Appliquer des notions fondamentales de la communication en français liées au champ d'études de l'élève. (To apply basic concepts for communicating in French in relation to the student's field of study.)

or

4SFQ Communiquer en français sur des sujets liés au champ d'études de l'élève. (To communicate in French on topics related to the student's field of study.)

or

4SFR Communiquer avec aisance en français sur des sujets liés au champ d'études de l'élève. (To communicate with ease in French on topics related to the student's field of study.)

or

4SFS Dissserter en français sur un sujet lié au champ d'études. (To discourse in French on a topic related to the student's field of study.)

Physical Education

4EP0 To analyze physical activity from the standpoint of lifestyle behaviours that promote health.

4EP1 To improve effectiveness when practising a physical activity.

4EP2 To demonstrate the ability to manage health-enhancing physical activity.

Complementary General Education

4 credits

2 objectives to be met from the following:

000V To estimate the contribution of the social sciences to an understanding of contemporary issues.

000W To analyze one of the major problems of our time using one or more social scientific approaches.

000X To explain the general nature of science and technology and some of the major contemporary scientific or technological issues.

000Y To resolve a simple problem by applying the basic scientific method.

000Z To communicate with limited skill in a modern language.

0010 To communicate on familiar topics in a modern language.

0067 To communicate with relative ease in a modern language.

0011 To recognize the role of mathematics or informatics in contemporary society.

- 0012 To use various mathematical or computer concepts, procedures and tools for common tasks.
- 0013 To consider various forms of art produced by aesthetic practices.
- 0014 To produce a work of art.
- 021L To consider contemporary issues from a cross-disciplinary perspective.
- 021M To deal with a contemporary issue from a cross-disciplinary perspective.

Specific Education

32 credits

Objectives Common to All Students

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

- 00UL To analyze chemical and physical changes in matter using concepts associated with the structure of atoms and molecules.
- 00UN To apply the methods of differential calculus to the study of functions and problem solving.
- 00UP To apply the methods of integral calculus to the study of functions and problem solving.
- 00UQ To apply the methods of linear algebra and vector geometry to problem solving.
- 00UR To analyze various situations and phenomena in physics using the basic principles of classical mechanics.
- 00US To analyze various situations and phenomena in physics using the basic laws of electricity and magnetism.
- 00UT To 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 To apply basic concepts in discrete mathematics to problem solving.

020W To develop programs to solve simple problems.

020X To organize and manipulate data.

020Y To design and develop programs in a graphic environment.

020Z To demonstrate their integration of the learning in the *Computer Science and Mathematics* program.

SECOND PART:
PROGRAM
OBJECTIVES AND STANDARDS

Objective**Standard****Statement of the Competency**

To analyze and produce various forms of discourse.

Elements of the Competency**Performance Criteria**

1. To identify the characteristics and functions of the components of literary texts.
2. To determine the organization of facts and arguments of a given literary text.
3. To prepare ideas and strategies for a projected discourse.
4. To explicate a discourse.
5. To edit the discourse.

- Accurate explanation of the denotation of words.
- Adequate recognition of the appropriate connotation of words.
- Accurate definition of the characteristics and function of each component.
- Clear and accurate recognition of the main idea and structure.
- Clear presentation of the strategies employed to develop an argument or thesis.
- Appropriate identification of topics and ideas.
- Adequate gathering of pertinent information.
- Clear formulation of a thesis.
- Coherent ordering of supporting material.
- Appropriate choice of tone and diction.
- Correct development of sentences.
- Clear and coherent development of paragraphs.
- Explication of a 750-word discourse.
- Appropriate use of revision strategies.
- Accurate correction of the discourse.

Learning Activities

Discipline:	English, Language of Instruction and Literature
Weighting:	2-2-4 or 1-3-4
Number of credits:	2 2/3

Objective**Standard****Statement of the Competency**

To apply a critical approach to literary genres.

Elements of the Competency**Performance Criteria**

- | | |
|--|---|
| 1. To distinguish genres of literary texts. | <ul style="list-style-type: none"> • Clear recognition of the formal characteristics of a literary genre. |
| 2. To recognize the use of literary conventions within a specific genre. | <ul style="list-style-type: none"> • Accurate recognition of the figurative communication of meaning. • Adequate explanation of the effects of significant literary and rhetorical devices. |
| 3. To situate a work within its historical and literary period. | <ul style="list-style-type: none"> • Appropriate recognition of the relationship of a text to its period. |
| 4. To explicate a discourse representative of a literary genre. | <ul style="list-style-type: none"> • Appropriate choice and use of terminology. • Effective presentation of a 1000-word integrated response to a text. |
| 5. To edit the discourse. | <ul style="list-style-type: none"> • Appropriate use of revision strategies. • Accurate correction of the discourse. |

Learning Activities

Discipline:	English, Language of Instruction and Literature
Weighting:	2-2-3
Number of credits:	2 1/3

Objective**Standard****Statement of the Competency**

To apply a critical approach to a literary theme.

Elements of the Competency**Performance Criteria**

1. To recognize the treatment of a theme within a literary text.
2. To situate a literary text within its cultural context.
3. To detect the value system inherent in a literary text.
4. To explicate a discourse from a thematic perspective.
5. To edit the discourse.

- Clear recognition of elements within the text, which define and reinforce a theme and its development.
- Adequate demonstration of the effects of significant literary and rhetorical devices.
- Appropriate recognition of a text as an expression of cultural context.
- Adequate demonstration of the effects of significant literary and rhetorical devices.
- Appropriate identification of expression (explicit / implicit) of a value system in a text.
- Appropriate choice and use of terminology.
- Effective presentation of a 1000-word integrated response to a text.
- Appropriate use of revision strategies.
- Accurate correction of the discourse.

Learning Activities

Discipline: English, Language of Instruction and Literature
 Weighting: 2-2-3
 Number of credits: 2 1/3

Objective**Standard****Statement of the Competency**

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

Elements of the Competency**Performance Criteria**

1. To identify the forms of discourse appropriate to given fields of study.
2. To recognize the discursive frameworks appropriate to given fields of study.
3. To explicate an oral and a written discourse.
4. To edit the discourse.

- Accurate recognition of specialized vocabulary and conventions.
- Accurate recognition of the characteristics of the form of discourse.
- Exploration of a variety of topics.
- Clear and accurate recognition of the main ideas and structure.
- Appropriate distinction between fact and argument.
- Examine ways to address and structure a given topic.
- Appropriate choice of tone and diction.
- Correctly developed sentences.
- Clearly and coherently developed paragraphs.
- Appropriate use of program-related communication strategies including media and technology.
- Explication of a 1000-word discourse.
- Appropriate use of revision strategies.
- Accurate correction of the discourse.

Learning Activities

Discipline:	English, Language of Instruction and Literature
Number of contact hours:	60
Number of credits:	2

Humanities

Code: 4HU0

Objective**Standard****Statement of the Competency**

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

Elements of the Competency**Performance Criteria**

1. To recognize the basic elements of a field of knowledge.
2. To define the modes of organization and utilization of a field of knowledge.
3. To situate a field of knowledge within its historical context.
4. To organize the main components into coherent patterns.
5. To produce a synthesis of the main components.

- Appropriate description of the basic elements.
- Appropriate use of terminology relevant to fields of knowledge.
- Adequate definition of the dimensions, limits, and uses of fields of knowledge.
- Accurate identification of the main components in the historical development of fields of knowledge.
- Accurate description of the effects of historical development and societal milieu on the limitations and uses of a field of knowledge.
- Coherent organization of the main components.
- Appropriate analysis of the components.
- Coherent synthesis of the main components.
- Appropriate expression, including a significant individual written component, of an analysis of the context, importance and implications of the organization and uses of knowledge.
- Appropriate use of revision strategies.
- Appropriate correction of form and content.

Learning Activities

Discipline:	Humanities
Weighting:	3-1-3
Number of credits:	2 1/3

Standard

Humanities

Code: 4HUP

Objective**Standard****Statement of the Competency**

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

Elements of the Competency

1. To situate significant ethical issues, in appropriate world views and fields of knowledge.
2. To explain the major ideas, values, and social implication of ethical issues.
3. To organize the ethical questions and their implications into coherent patterns.
4. To debate the ethical issues.

Performance Criteria

- Accurate recognition of the basic elements of ethical issues.
- Appropriate use of relevant terminology.
- Adequate identification of the main linkages with world views and fields of knowledge.
- Adequate description of the salient components of the issues.
- Coherent organization of the ethical questions and their implications.
- Appropriate expression, including a significant individual written component, of an analysis of the context, importance and implications of the issues.
- Adequate development of substantiated argumentation including context and diverse points of view.
- Clear articulation of an individual point of view.
- Appropriate use of revision strategies.
- Appropriate correction of form and content.

Learning Activities

Discipline:	Humanities
Number of contact hours:	45
Number of credits:	2

Objectif**Standard****Énoncé de la compétence**

Appliquer les notions de base de la communication en français courant.

Éléments de la compétence**Critères de performance**

1. Rédiger et réviser un texte simple.

- Formulation claire et cohérente d'un texte d'environ 250 mots.
- Élaboration suffisante du texte : intention d'écriture, sujet, lecteur.
- Formulation de phrases simples bien construites.
- Utilisation d'un vocabulaire suffisant pour la tâche.
- Application satisfaisante du code grammatical, en particulier : l'accord en genre et en nombre, les verbes réguliers, les temps de verbes au présent, au passé composé et au futur simple.
- Correction satisfaisante des erreurs orthographiques et grammaticales.
- Utilisation appropriée de stratégies de révision.

2. Dégager le sens d'un texte simple.

- Description précise du sens général et des idées essentielles d'un texte de 500 mots.
- Repérage précis des difficultés de compréhension du texte.
- Utilisation pertinente des techniques de lecture.
- Distinction claire des principaux éléments du texte.

3. Émettre un message oral simple.

- Formulation claire et cohérente d'un exposé d'au moins quatre minutes.
- Emploi pertinent du vocabulaire courant.
- Expression intelligible des énoncés.

4. Dégager le sens d'un message oral simple.

- Distinction précise du sens général et des idées essentielles d'un message d'au moins quatre minutes.
- Repérage précis des difficultés de compréhension du message.
- Description précise du sens général et des idées essentielles du message.

Activités d'apprentissage

Discipline : Français, langue seconde
 Pondération : 2-1-3
 Nombre d'unités : 2

Objectif**Standard****Énoncé de la compétence**

Communiquer en français courant avec une certaine aisance.

Éléments de la compétence**Critères de performance**

1. Rédiger et réviser un texte simple.

- Rédaction d'un texte d'environ 350 mots.
- Respect du code grammatical et orthographique.
- Utilisation judicieuse des principaux éléments du corpus.
- Formulation claire et cohérente des phrases.
- Articulation cohérente des paragraphes.
- Utilisation appropriée de stratégies de révision.
- Correction satisfaisante des erreurs orthographiques et grammaticales.

2. Interpréter un texte écrit.

- Repérage précis des idées principales et de la structure d'un texte de 700 à 1 000 mots.
- Distinction claire des principaux éléments du texte.
- Explication précise du sens des mots du texte.

3. Produire un texte oral planifié.

- Formulation claire et cohérente d'un exposé d'au moins cinq minutes.
- Emploi pertinent du vocabulaire courant.
- Respect du niveau de langue, du code grammatical et des règles de la prononciation.

4. Interpréter un texte oral simple.

- Distinction claire des principaux éléments d'un texte oral d'au moins cinq minutes.
- Repérage précis des idées et des sujets traités dans le texte.
- Explication précise du sens des mots du texte.

Activités d'apprentissage

Discipline : Français, langue seconde
 Pondération : 2-1-3
 Nombre d'unités : 2

Objectif**Standard****Énoncé de la compétence**

Communiquer avec aisance en français courant.

Éléments de la compétence**Critères de performance**

1. Rédiger un texte de complexité moyenne.

- Rédaction d'un texte d'environ 450 mots.
- Respect du code grammatical et orthographique.
- Adaptation au lecteur ou à la lectrice.
- Utilisation judicieuse des principaux éléments du corpus.
- Formulation claire et cohérente des phrases, dont au moins trois sont complexes.
- Articulation cohérente des paragraphes.

2. Réviser et corriger un texte de complexité moyenne.

- Utilisation appropriée de stratégies de révision.
- Correction appropriée du texte.

3. Commenter un texte écrit de complexité moyenne.

- Distinction claire des principaux éléments d'un texte comprenant entre 2 500 et 3 000 mots.
- Explication précise du sens des mots dans le texte.
- Distinction précise des idées principales et secondaires, des faits et des opinions.
- Distinction juste entre l'implicite et l'explicite.

4. Produire un texte oral planifié de complexité moyenne.

- Formulation claire et cohérente d'un exposé d'au moins cinq minutes.
- Emploi pertinent du vocabulaire courant.
- Respect du niveau de langue, du code grammatical et des règles de la prononciation.
- Adaptation à l'interlocuteur ou à l'interlocutrice.
- Agencement pertinent des idées.

Activités d'apprentissage

Discipline : Français, langue seconde
 Pondération : 2-1-3
 Nombre d'unités : 2

Objectif**Standard****Énoncé de la compétence**

Traiter d'un sujet culturel et littéraire.

Éléments de la compétence**Critères de performance**

1. Rédiger un texte sur un sujet culturel ou littéraire.

- Formulation claire et cohérente d'un texte d'environ 550 mots.
- Respect du sujet.
- Respect du code grammatical et orthographique.
- Adaptation au lecteur ou à la lectrice.
- Utilisation judicieuse des principaux éléments du corpus.
- Articulation claire d'un point de vue personnel.

2. Réviser et corriger un texte portant sur un sujet culturel ou littéraire.

- Utilisation appropriée de stratégies de révision.
- Correction appropriée du texte.

3. Analyser un texte culturel ou littéraire.

- Formulation personnelle des éléments principaux du texte.
- Inventaire des thèmes principaux.
- Relevé d'indices qui permettent de situer le texte dans son contexte socioculturel et historique.
- Repérage juste des valeurs véhiculées.
- Repérage juste de la structure du texte.
- Articulation claire d'un point de vue personnel.

Activités d'apprentissage

Discipline : Français, langue seconde
 Pondération : 3-0-3
 Nombre d'unités : 2

Objectif**Standard****Énoncé de la compétence**

Appliquer des notions fondamentales de la communication en français, liées au champ d'études de l'élève.

Éléments de la compétence

1. Rédiger et réviser un court texte lié à son champ d'études.
2. Dégager le sens et les caractéristiques d'un texte lié à son champ d'études.
3. Émettre un message oral simple lié à son champ d'études.

Critères de performance

- Repérage précis de difficultés dans l'expression écrite.
- Utilisation pertinente des techniques d'écriture.
- Utilisation pertinente du vocabulaire courant et spécialisé.
- Formulation claire et cohérente du texte.
- Utilisation appropriée de stratégies de révision.
- Correction satisfaisante des erreurs orthographiques et grammaticales.
- Repérage précis des difficultés de compréhension du texte.
- Distinction juste des caractéristiques du texte.
- Repérage précis du vocabulaire spécialisé.
- Distinction claire des principaux éléments du texte.
- Description précise du sens général et des idées essentielles du texte.
- Repérage précis des difficultés d'expression orale.
- Utilisation pertinente des techniques d'expression orale.
- Utilisation pertinente du vocabulaire courant et spécialisé.
- Expression intelligible du propos.

Français, langue seconde (niveau I)

Code : 4SFP

4. Dégager le sens d'un message oral simple lié à son champ d'études.
- Repérage précis des difficultés de compréhension du message.
 - Distinction juste des caractéristiques du message.
 - Repérage juste du vocabulaire spécialisé.
 - Distinction claire des principaux éléments du message.
 - Description précise du sens général et des idées essentielles du message.

Activités d'apprentissage

Discipline : Français, langue seconde
Nombre d'heures-contact : 45
Nombre d'unités : 2

Objectif**Standard****Énoncé de la compétence**

Communiquer en français sur des sujets liés au champ d'études de l'élève.

Éléments de la compétence**Critères de performance**

1. Rédiger un texte lié à son champ d'études.

- Emploi pertinent du vocabulaire spécialisé et des conventions propres aux différents types de textes.
- Respect du niveau de langue, du code grammatical et du code orthographique.
- Formulation claire et cohérente du propos.
- Utilisation pertinente des techniques d'écriture.

2. Réviser et corriger un texte portant sur un sujet lié à son champ d'études.

- Utilisation appropriée de stratégies de révision.
- Correction satisfaisante des erreurs orthographiques et grammaticales.

3. Distinguer les types de textes propres à son champ d'études.

- Distinction précise des caractéristiques formelles de chacun des principaux types de textes et des conventions utilisées.

4. Interpréter des textes représentatifs de son champ d'études.

- Distinction claire des principaux éléments du texte.
- Interprétation claire du vocabulaire spécialisé.
- Repérage précis des idées et des sujets traités.
- Utilisation pertinente des techniques de lecture et d'écoute.

Activités d'apprentissage

Discipline : Français, langue seconde
 Nombre d'heures-contact : 45
 Nombre d'unités : 2

Objectif**Standard****Énoncé de la compétence**

Communiquer avec aisance en français sur des sujets liés au champ d'études de l'élève.

Éléments de la compétence

1. Produire un texte sur un sujet lié à son champ d'études.
2. Réviser et corriger un texte portant sur un sujet lié à son champ d'études.
3. Commenter des textes propres à son champ d'études.

Critères de performance

- Respect du sujet.
- Emploi pertinent du vocabulaire spécialisé et des conventions propres aux différents types de textes.
- Respect du niveau de langue, du code grammatical et du code orthographique.
- Formulation claire et cohérente du propos.
- Agencement pertinent des idées.
- Adéquation entre forme et fond.
- Utilisation appropriée de stratégies de révision.
- Correction satisfaisante des erreurs orthographiques et grammaticales.
- Distinction précise des caractéristiques formelles des principaux types de textes et des conventions utilisées.
- Explication précise du sens des mots dans le texte.
- Repérage précis de la structure du texte.
- Reformulation juste des idées principales et secondaires, des faits et des opinions.
- Emploi juste du vocabulaire spécialisé.

Activités d'apprentissage

Discipline : Français, langue seconde
 Nombre d'heures-contact : 45
 Nombre d'unités : 2

Objectif**Standard****Énoncé de la compétence**

Dissenter en français sur un sujet lié au champ d'études de l'élève.

Éléments de la compétence

1. Rédiger un texte sur un sujet lié à son champ d'études.
2. Réviser et corriger un texte portant sur un sujet lié à son champ d'études.
3. Analyser un texte lié à son champ d'études.

Critères de performance

- Respect du sujet.
- Emploi pertinent du vocabulaire spécialisé et des conventions propres aux différents types de textes.
- Choix judicieux des principaux éléments du corpus en fonction du type de texte.
- Formulation claire et cohérente du texte.
- Respect du niveau de langue, du code grammatical et du code orthographique.
- Articulation claire d'un point de vue personnel.
- Utilisation appropriée de stratégies de révision.
- Correction satisfaisante des erreurs orthographiques et grammaticales.
- Distinction précise des caractéristiques formelles des types particuliers de textes.
- Formulation personnelle des éléments principaux.
- Inventaire des thèmes principaux.
- Repérage juste de la structure du texte.
- Relevé d'indices qui permettent de situer le texte dans son contexte.
- Articulation claire d'un point de vue personnel.
- Association juste des éléments du texte au sujet traité.

Activités d'apprentissage

Discipline : Français, langue seconde
 Nombre d'heures-contact : 45
 Nombre d'unités : 2

French, Second Language (Level I)

Code: 4SF0

Objective**Standard****Statement of the Competency**

To apply basic concepts for communicating in standard French.

Elements of the Competency**Performance Criteria**

1. To write and revise a simple text.

- Clear, coherent formulation of a text of about 250 words.
- Adequate development of the text: intention, topic, reader.
- Formulation of simple, well-constructed sentences.
- Use of adequate vocabulary for the task.
- 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.
- Satisfactory correction of errors in spelling or grammar.
- Appropriate use of revision strategies.

2. To understand the meaning of a simple text.

- Clear description of the general meaning and essential ideas of a 500-word text.
- Precise identification of the difficulties in understanding the text.
- Appropriate use of reading techniques.
- Clear differentiation of the main elements of the text.

3. To convey a simple oral message.

- Clear and coherent formulation of a presentation at least four minutes long.
- Appropriate use of standard vocabulary.
- Intelligible statements.

4. To understand the meaning of a simple oral message.

- Precise differentiation of the general meaning and essential ideas of a message at least four minutes long.
- Precise identification of the difficulties in understanding the message.
- Precise description of the general meaning and essential ideas of the message.

Learning Activities

Discipline: French as a Second Language
 Weighting: 2-1-3
 Number of credits: 2

Objective**Standard****Statement of the Competency**

To communicate in standard French with some ease.

Elements of the Competency**Performance Criteria**

1. To write and revise a simple text.

- Writing of a text of about 350 words.
- Respect of 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. To interpret a written text.

- Precise identification of the main ideas and structure of a text of 700 to 1000 words.
- Clear differentiation of the main elements of the text.
- Precise explanation of the meaning of the words of the text.

3. To produce a planned oral text.

- Clear and coherent formulation of a presentation at least five minutes long.
- Appropriate use of standard vocabulary.
- Respect of the level of language and rules of grammar and pronunciation.

4. To interpret a simple oral text.

- Clear differentiation of the main elements of an oral text at least five minutes long.
- Precise identification of the ideas and subjects dealt with in the text.
- Precise explanation of the meaning of the words of the text.

Learning Activities

Discipline: French as a Second Language
 Weighting: 2-1-3
 Number of credits: 2

Objective**Standard****Statement of the Competency**

To communicate with ease in standard French.

Elements of the Competency**Performance Criteria**

1. To write a text of moderate complexity.

- Writing of a text of about 450 words.
- Respect of grammar and spelling rules.
- Adaptation to the reader.
- Appropriate use of the main elements of the corpus.
- Clear and coherent formulation of sentences, including at least three that are complex.
- Coherent organization of paragraphs.

2. To revise and correct a text of moderate complexity.

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

3. To comment on a written text of moderate complexity.

- Clear differentiation of the main elements of a text of between 2500 and 3000 words.
- Precise explanation of the meaning of the words of the text.
- Precise differentiation of the main and secondary ideas, of facts and opinions.
- Accurate differentiation of what is implicit and what is explicit.

4. To produce a planned oral text of moderate complexity.

- Clear and coherent formulation of a presentation at least five minutes long.
- Appropriate use of standard vocabulary.
- Respect of the level of language and rules of grammar and pronunciation.
- Adaptation to the listener.
- Appropriate sequence of ideas.

Learning Activities

Discipline:	French as a Second Language
Weighting:	2-1-3
Number of credits:	2

Objective**Standard****Statement of the Competency**

To deal with a cultural and literary topic.

Elements of the Competency**Performance Criteria**

1. To write a text on a cultural or literary topic.

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

2. To revise and correct a text on a cultural or literary topic.

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

3. To 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**

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

Elements of the Competency**Performance Criteria**

1. To write and revise a short text related to the student's field of study.

- Precise identification of difficulties in writing.
- Appropriate use of writing techniques.
- Appropriate use of standard and specialized vocabulary.
- Clear and coherent formulation of the text.
- Appropriate use of revision strategies.
- Satisfactory correction of spelling and grammatical errors.

2. To understand the meaning and characteristics of a text related to the student's field of study.

- Precise identification of difficulties in understanding the text.
- Accurate differentiation of the characteristics of the text.
- Precise identification of specialized vocabulary.
- Clear differentiation of the main elements of the text.
- Precise description of the general meaning and essential ideas of the text.

3. To convey a simple oral message related to the student's field of study.

- Precise identification of the difficulties in oral expression.
- Appropriate use of techniques of oral expression.
- Appropriate use of standard and specialized vocabulary.
- Intelligible expression of the message.

4. To understand the meaning of a simple oral message related to the student's field of study.

- Precise identification of difficulties in understanding the message.
- Accurate differentiation of the characteristics of the message.
- Accurate identification of specialized vocabulary.
- Clear differentiation of the main elements of the message.
- Precise description of the general meaning and essential ideas of the message.

Learning Activities

Discipline: French as a Second Language
 Number of contact hours : 45
 Number of credits: 2

French, Second Language (Level II)

Code: 4SFQ

Objective**Standard****Statement of the Competency**

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

Elements of the Competency**Performance Criteria**

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

Learning Activities

Discipline:	French as a Second Language
Number of contact hours :	45
Number of credits:	2

French, Second Language (Level III)

Code: 4SFR

Objective**Standard****Statement of the Competency**

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

Elements of the Competency**Performance Criteria**

1. To produce a text on a topic related to the student's field of study.
2. To revise and correct a text on a topic related to the student's field of study.
3. To comment on texts specific to the student's field of study.

- Respect of the topic.
- Appropriate use of specialized vocabulary and the conventions specific to different types of texts.
- Respect of the level of language and rules of grammar and spelling.
- Clear and coherent formulation of the text.
- Appropriate sequence of ideas.
- Appropriate form for the content.
- Appropriate use of revision strategies.
- Satisfactory correction of spelling and grammatical errors.
- Precise differentiation of the formal characteristics of the main types of texts and the conventions used.
- Precise explanation of the meaning of the words in the text.
- Precise identification of the structure of the text.
- Accurate reformulation of the main and secondary ideas, of the facts and opinions.
- Accurate use of specialized vocabulary.

Learning Activities

Discipline: French as a Second Language
 Number of contact hours: 45
 Number of credits: 2

Objective**Standard****Statement of the Competency**

To discourse in French on a topic related to the student's field of study.

Elements of the Competency**Performance Criteria**

1. To write a text on a topic related to the student's field of study.
2. To revise and correct a text on a topic related to the student's field of study.
3. To analyze a text related to the student's field of study.

- Respect of 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 of the level of language and rules of grammar and spelling.
- Clear articulation of a personal point of view.
- Appropriate use of revision strategies.
- Satisfactory correction of spelling and grammatical errors.
- 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
Number of contact hours:	45
Number of credits:	2

Objective**Standard****Statement of the Competency**

To analyze physical activity from the standpoint of lifestyle behaviours that promote health.

Elements of the Competency**Performance Criteria**

1. To establish the relationship between lifestyle habits and health.
2. To be physically active in a manner that promotes health.
3. To recognize needs, abilities and motivational factors with respect to regular and sufficient physical activity.
4. To propose physical activities that promote health.

- Proper use of documentation from scientific research or the media.
- Recognition of the influence of social and cultural factors on the practice of physical activity.
- Establish pertinent relationships between main lifestyle behaviours and their impact on health.
- Respect for the rules of physical activity.
- Respect for the rules of ethics and safety regulations.
- Respect for personal abilities when practising physical activities.
- Appropriate use of the quantitative and qualitative physical evaluation strategies.
- Statement of main physical needs and abilities.
- Statement of main motivational factors with respect to being sufficiently active on a regular basis.
- Appropriate choice of physical activities according to needs, abilities and motivational factors.
- Use of clear arguments to explain the choice of physical activity.

Learning Activities

Discipline: Physical Education
 Weighting: 1-1-1
 Number of credits: 1

Objective**Standard****Statement of the Competency**

To improve effectiveness when practising a physical activity.

Elements of the Competency

1. To plan an approach leading to improved effectiveness in a physical activity.
2. To use an approach leading to improved effectiveness in a physical activity.

Performance Criteria

- Initial assessment of abilities and attitudes when practising a physical activity.
- Statement of expectations and needs with respect to the ability to practise the activity.
- Appropriate formulation of personal objectives.
- Appropriate choice of the means to achieve the objectives.
- Use of clear arguments to explain the choice of physical activity.
- Respect for the rules of the physical activity.
- Respect for the rules of ethics and safety regulations.
- Appropriate use of the quantitative and qualitative physical evaluation strategies of motor skills.
- Periodic statement of abilities and attitudes when practising a physical activity.
- Meaningful interpretation of progress achieved and the difficulties experienced during the physical activity.
- Pertinent, periodic and proper adjustments of objectives or means.
- Appreciable improvement of motor skills, techniques or complex strategies required by the physical activity.

Learning Activities

Discipline:	Physical Education
Weighting:	0-2-1
Number of credits:	1

Objective**Standard****Statement of the Competency**

To demonstrate the ability to manage health-enhancing physical activity.

Elements of the Competency**Performance Criteria**

1. To plan a personal program of physical activities.
2. To combine the elements of a regular and sufficient practice in a health enhancing approach to physical activity.
3. To manage a personal physical activity program.

- Mention of priorities according to 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 practice.
- Appropriate planning of how the physical activity or activities in the personal program are to be carried out.
- Respect for the rules of physical activity.
- Respect for the rules of ethics and safety regulations.
- Regular and sufficient practice of a physical activity while maintaining the balance between a search for effectiveness and health-enhancing factors.
- Appropriate choice of criteria to measure program objective attainment.
- Appropriate use of the quantitative and qualitative physical evaluation strategies.
- Periodic statement of time invested and activities carried out during the program.
- Appropriate, periodic and proper adjustment of objectives or means.
- Meaningful interpretation of the progress achieved and difficulties experienced during the activity.
- Recognition of the influence of physical activity on lifestyle.

Learning Activities

Discipline:	Physical Education
Weighting:	1-1-1
Number of credits:	1

Social Sciences

Code: 000V

Objective**Standard****Statement of the Competency**

To estimate the contribution of the social sciences to an understanding of contemporary issues.

Achievement Context

Students will work alone.

They will write an essay of approximately 750 words on the contribution of the social sciences to an understanding of contemporary issues.

Documents and data from the field of social sciences may be used.

Elements of the Competency**Performance Criteria**

1. To recognize the focus of one or more of the social sciences and their main approaches.
2. To identify some of the issues currently under study in the social sciences.
3. To demonstrate the contribution of one or more of the social sciences to an understanding of contemporary issues.

- Formulation of the focus specific to one or more of the social sciences.
- Description of the main approaches used in the social sciences.
- Association of issues with the pertinent areas of research in the social sciences.
- Presentation of contemporary issues by emphasizing the interpretation of the social sciences.
- Illustration of the interaction between certain social changes and the contribution of the social sciences.

Learning Activities

Number of contact hours: 45
Number of credits: 2

Social Sciences

Code: 000W

Objective**Standard****Statement of the Competency**

To analyze one of the major problems of our time using one or more social scientific approaches.

Achievement Context

Students will work alone.

They will write an essay of approximately 750 words on a topic related to human existence.

Reference materials from the field of social sciences may be used.

Elements of the Competency

1. To formulate a problem using one or more social scientific approaches.
2. To deal with an issue using one or more social scientific approaches.
3. To draw conclusions.

Performance Criteria

- Presentation of the background to the problem.
- Use of appropriate concepts and language.
- Brief description of individual, collective, spatio-temporal and cultural aspects of the problem.
- Clear formulation of an issue.
- Selection of pertinent reference materials.
- Brief description of historical, experimental and survey methods.
- Appropriate use of the selected method.
- Determination of appropriate evaluation criteria.
- Identification of strengths and weaknesses of the conclusions.
- Broadening of the issue analyzed.

Learning Activities

Number of contact hours: 45
Number of credits: 2

Science and Technology

Code: 000X

Objective**Standard****Statement of the Competency**

To explain the general nature of science and technology and some of the major contemporary scientific or technological issues.

Achievement Context

Students will work alone.

They will use a written commentary on a scientific discovery or technological development.

They will write an essay of approximately 750 words.

Elements of the Competency**Performance Criteria**

1. To describe the standard scientific mode of thought and method.
2. To demonstrate how science and technology are complementary.
3. To explain the context and the stages related to several scientific and technological discoveries.
4. To deduce different consequences and questions resulting from certain recent scientific and technological developments.

- Brief description of the essential characteristics of the scientific mode of thought, including quantification and demonstration.
- Organized list and brief description of the essential characteristics of the main steps in the standard scientific method.
- Definition of terms and description of the primary ways in which science, techniques and technology are interrelated: logical and temporal connections, and mutual contributions.
- Pertinent and coherent explanation of the relationship between the determining contexts related to several scientific and technological discoveries.
- List of the main stages of scientific and technological discoveries.
- Brief description of important consequences (of different types) and the current major challenges resulting from several scientific and technological discoveries.
- Formulation of relevant questions and credibility of responses to the questions formulated.

Learning Activities

Number of contact hours: 45
Number of credits: 2

Objective**Standard****Statement of the Competency**

To resolve a simple problem by applying the basic scientific method.

Achievement Context

Students will work alone or in groups.

They will be given a scientific and technological problem that is not complex and that can be resolved by applying the standard scientific method.

Common scientific instruments and reference materials (written or other) may be used.

Elements of the Competency

1. To describe the main steps of the standard scientific method.
2. To formulate a hypothesis designed to solve a simple scientific and technological problem.
3. To verify a hypothesis by applying the fundamental principles of the basic experimental method.

Performance Criteria

- Organized list and brief description of the characteristics of the steps of the standard scientific method.
- Clear, precise description of the problem
- Observance of the principles for formulating a hypothesis (observable and measurable nature of data, credibility, etc.).
- Pertinence, reliability and validity of the experimental method used.
- Observance of established experimental method.
- Appropriate choice and use of instruments.
- Clear, satisfactory presentation of results.
- Validity of the connections established between the hypothesis, the verification and the conclusion.

Learning Activities

Number of contact hours: 45
 Number of credits: 2

Objective**Standard****Statement of the Competency**

To communicate with limited skill* in a modern language.

Achievement Context

For modern languages that use the Latin alphabet, students will:

- have a conversation that includes at least 8 lines of dialogue;
- write a text consisting of at least 8 sentences.

For modern languages that use a writing system other than the Latin alphabet, students will:

- have a conversation that includes at least 6 lines of dialogue;
- write a text consisting of at least 6 sentences.

Students will be exposed to learning situations on familiar themes.

Reference materials may be used.

Elements of the Competency**Performance Criteria**

The acquisition of a modern language requires an awareness of the culture of the people who use the language.

1. To understand the meaning of a verbal message.

- Accurate identification of words and idiomatic expressions.
- Clear recognition of the general meaning of simple messages.
- Logical connection between the various elements of the message.

2. To understand the meaning of a written message.

- Accurate identification of words and idiomatic expressions.
- Clear recognition of the general meaning of simple messages.
- Logical connection between the various elements of the message.

Modern Language

Code: 000Z

3. To express a simple message verbally.
- Appropriate use of language structures in main and coordinate clauses.
 - Appropriate application of grammar rules.
 - Use of verbs in the present indicative.
 - Appropriate use of basic vocabulary and idiomatic expressions.
 - Understandable pronunciation.
 - Coherent sequence of simple sentences.
 - Spontaneous and coherent sequence of sentences during a conversation.
4. To write a text on a given subject.
- Appropriate use of language structures in main and coordinate clauses.
 - Appropriate application of basic grammar rules.
 - Use of verbs in the present indicative.
 - Appropriate use of basic vocabulary and idiomatic expressions.
 - Coherent sequence of simple sentences.
 - Acceptable application of graphic rules for writing systems other than the Latin alphabet.
- * This refers to the limited use of language structures, grammar and vocabulary. This limitation varies depending on the complexity of the modern language.

Learning Activities

Number of contact hours: 45
 Number of credits: 2

Objective**Standard****Statement of the Competency**

To communicate on familiar topics in a modern language.

Achievement Context

Students will have a conversation that includes at least 15 lines of dialogue.

They will write a text consisting of at least 20 sentences for Latin-alphabet languages.

They will write a text consisting of at least 10 sentences for languages not using the Latin alphabet.

Students will be exposed to:

- common situations in everyday life;
- simple topics from everyday life.

Reference materials may be used.

Elements of the Competency**Performance Criteria**

The acquisition of a modern language requires an awareness of the culture of the people who use the language.

1. To understand the meaning of a verbal message.

- Accurate identification of words and idiomatic expressions.
- Clear recognition of the general meaning and essential ideas of messages of average complexity.
- Logical connection between the various elements of the message.

2. To understand the meaning of a written message.

- Accurate identification of words and idiomatic expressions.
- Clear recognition of the general meaning and essential ideas of messages of average complexity.
- Logical connection between the various elements of the message.

Modern Language**Code: 0010**

3. To express a simple message verbally, using sentences of average complexity.
 - Appropriate use of language structures in main or subordinate clauses.
 - Appropriate application of grammar rules.
 - Use of verbs in the present indicative.
 - Appropriate use of enriched basic vocabulary and idiomatic expressions.
 - Understandable pronunciation.
 - Coherent sequence of sentences of average complexity.
 - Conversation.

4. To write a text on a given subject, using sentences of average complexity.
 - Appropriate use of language structures in main or subordinate clauses.
 - Appropriate application of grammar rules.
 - Use of verbs in the present and past indicative.
 - Appropriate use of enriched basic vocabulary and idiomatic expressions.
 - Coherent sequence of sentences of average complexity.
 - Acceptable application of graphic rules for writing systems other than the Latin alphabet.

Learning Activities

Number of contact hours: 45
 Number of credits: 2

Modern Language

Code: 0067

Objective**Standard****Statement of the Competency**

To communicate with relative ease in a modern language.

Achievement Context

Students will work alone.

They will have a conversation that includes at least 20 lines of dialogue.

They will write a text of medium length (at least 25 sentences for Latin-alphabet languages and 15 sentences for other languages).

They will use documents of a sociocultural nature.

Reference materials for the written text may be used.

Elements of the Competency**Performance Criteria**

The acquisition of a modern language requires an awareness of the culture of the people who use the language.

1. To understand the meaning of a verbal message in everyday language.

- Accurate explanation of the general meaning and essential ideas of the message.
- Clear identification of structural elements of the language.

2. To understand the meaning of a text of average complexity.

- Accurate explanation of the general meaning and essential ideas of the text.
- Clear identification of structural elements of the language.

3. To have a conversation on a subject.

- Appropriate use of the structural elements of the language according to the message to be expressed.
- Appropriate use of everyday vocabulary.
- Accurate pronunciation and intonation.
- Normal flow in a conversation in everyday language.
- Coherence of the message expressed.
- Pertinent responses to questions.

4. To write a text of average complexity.

- Appropriate use of the structural elements of the language according to the text to be written.
- Accurate vocabulary.
- Coherence of the text as a whole.
- Observance of presentation and writing rules applicable to the text.

Learning Activities

Number of contact hours: 45

Number of credits: 2

Objective**Standard****Statement of the Competency**

To recognize the role of mathematics or informatics in contemporary society.

Achievement Context

Students will work alone.

They will write an essay of approximately 750 words, using numerous concrete examples that they themselves will have selected.

Elements of the Competency**Performance Criteria**

1. To demonstrate the acquisition of basic general knowledge of mathematics or informatics.
2. To describe the evolution of mathematics or informatics.
3. To recognize the contribution of mathematics or informatics to the development of other areas of knowledge.
4. To illustrate the diversity of mathematical or informatics applications.
5. To evaluate the impact of mathematics or informatics on individuals and organizations.

- Identification of basic notions and concepts.
- Identification of main branches of mathematics or informatics.
- Appropriate use of terminology.
- Descriptive summary of several major phases.
- Demonstration of the existence of important contributions, using concrete examples.
- Presentation of a range of applications in various areas of human activity, using concrete examples.
- Identification of several major influences.
- Explanation of the way in which mathematics or informatics have changed certain human and organizational realities.
- Recognition of the advantages and disadvantages of these influences.

Learning Activities

Number of contact hours: 45
 Number of credits: 2

Objective**Standard****Statement of the Competency**

To use various mathematical or computer concepts, procedures and tools for common tasks.

Achievement Context

Students will work alone.

They will carry out a task or solve a problem based on everyday needs.

Familiar tools and reference materials may be used.

Elements of the Competency

1. To demonstrate the acquisition of basic functional knowledge in mathematics or informatics.
2. To select mathematical or computer tools and procedures on the basis of specific needs.
3. To use mathematical or computer tools and procedures to carry out tasks and solve problems.
4. To interpret the quantitative data or results obtained using mathematical or computer tools and procedures.

Performance Criteria

- Brief definition of concepts.
- Correct execution of basic operations.
- Appropriate use of terminology.
- List of numerous possibilities available with mathematical and computer tools and procedures.
- Analysis of concrete situations and recognition of the usefulness of mathematical or computer tools and procedures.
- Appropriate choice according to needs.
- Planned, methodical process.
- Correct use of tools and procedures.
- Satisfactory results, given the context.
- Appropriate use of terminology specific to a tool or procedure.
- Accurate interpretation, given the context.
- Clear, precise formulation of the interpretation.

Learning Activities

Number of contact hours: 45

Number of credits: 2

Objective**Standard****Statement of the Competency**

To consider various forms of art produced by aesthetic practices.

Achievement Context

Students will work alone.

They will use a specified work of art and write a commentary of approximately 750 words.

Elements of the Competency

1. To develop an appreciation for the dynamics of the imagination in art.
2. To describe art movements.
3. To give a commentary on a work of art.

Performance Criteria

- Precise explanation of a creative process connected to the construction of an imaginary universe.
- Descriptive list of the main characteristics of three art movements from different eras, including a modern movement.
- Coherent organization of observations, including identification of four fundamental elements of form and structure related to the language used as well as a justified description of the meaning of the work of art.

Learning Activities

Number of contact hours: 45
 Number of credits: 2

Objective**Standard****Statement of the Competency**

To produce a work of art.

Achievement Context

Students will work alone.

This is a practical exercise in creation or interpretation in which students will use the basic elements of the language and techniques specific to the medium selected.

Elements of the Competency

1. To recognize the primary forms of expression of an artistic medium.
2. To use the medium.

Performance Criteria

- Identification of specific features: originality, essential qualities, means of communication, styles, genres.
- Personal, coherent use of elements of language.
- Satisfactory application of artistic techniques.
- Observance of the requirements of the method of production.

Learning Activities

Number of contact hours: 45
 Number of credits: 2

Contemporary Issues

Code: 021L

Objective**Standard****Statement of the Competency**

To consider contemporary issues from a cross-disciplinary perspective.

Achievement Context

Individually or in groups.

Drawing on different areas of knowledge and based on documents and data from various disciplines.

Elements of the Competency**Performance Criteria**

1. To identify major contemporary issues.
2. To recognize the specific role of several disciplines in the understanding of an issue.
3. To demonstrate the contribution of several disciplines to the understanding of an issue.

- Exploration of various contemporary issues.
- Description of the main perspectives.
- Clear formulation of objects to study related to these issues.
- Description of some of the theories used in analyzing the issue.
- Clear description of the concepts and methods used.
- Clear formulation of the perspectives of the issue.
- Precise description of the main contributions of the disciplines.
- Pertinent explanation of the interaction among various disciplines.
- Appropriate use of language and concepts from the disciplines.

Learning Activities

Number of contact hours: 45
 Number of credits: 2

Note: This objective lends itself to teaching by one or more teachers.

Contemporary Issues

Code: 021M

Objective**Standard****Statement of the Competency**

To deal with a contemporary issue from a cross-disciplinary perspective.

Achievement Context

Individually or in groups.
Drawing on different areas of knowledge and based on documents and data from various disciplines.

Elements of the Competency**Performance Criteria**

1. To present a research problem.

- Justification of the choice of research problem.
- Brief description of the main issues involved in the problem.
- Clear formulation of the main dimensions of the problem.
- Appropriate use of language and concepts from the disciplines.
- Clear formulation of the research question.

2. To analyze the research problem.

- Relevant description of a research approach or method.
- Appropriate selection of research data.
- Proper application of the approach or method used.
- Appropriate use of an analytical framework.

3. To propose solutions.

- Clear description of the main contributions from the disciplines.
- Pertinent explanation of the interaction among various disciplines.
- Justification of solutions proposed.
- Assessment of the strengths and weaknesses of the proposed solutions.

Learning Activities

Number of contact hours: 45
Number of credits: 2

Note: This objective lends itself to teaching by one or more teachers.

Objective

Standard

Statement of the Competency

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

Elements of the Competency

1. To apply the probabilistic model of the atom in analyzing the properties of the elements.
2. To solve problems pertaining to the structure and states of matter using modern theories of chemistry.
3. To apply the laws of stoichiometry to the study of chemical phenomena.
4. To 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

Field of study: Science
Discipline: Chemistry
Weighting: 3-2-3
Number of credits: 2 2/3
Number of contact hours: 75

Specific 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

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

Elements of the Competency

1. To recognize and describe the characteristics of a function expressed in symbolic or graphic form.
2. To determine whether a function has a limit or is continuous or has a derivative at a point or on an interval.
3. To apply the rules and techniques of differentiation.
4. To use the derivative and related concepts to analyze the variations of a function and graph it.
5. To solve optimization and rate of change problems.

Performance Criteria

- Proper use of concepts.
- Representation of a situation as a function.
- Accurate graphic representation of a function.
- Correct choice and application of differentiation techniques.
- Algebraic operations in conformity with rules.
- Accuracy of calculations.
- Correct interpretation of results.
- Explanation of steps in problem-resolution procedure.
- Use of appropriate terminology.

Learning Activities

Field of study:	Science
Discipline:	Mathematics
Weighting:	3-2-3
Number of credits:	2 2/3
Number of contact hours:	75

Specific indications:	Functions: algebraic, exponential, logarithmic, trigonometric and inverse trigonometric. Limit: intuitive approach, definition, properties, calculation of limits. Continuity: definition and properties. Derivative: geometric interpretation, definition, standard rules and techniques. Applications: study of curves, optimization problems, rates of change.
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Objective

Standard

Statement of the Competency

To apply the methods of integral calculus to the study of functions and problem solving.

Elements of the Competency

1. To determine the indefinite integral of a function.
2. To calculate the limits of indeterminate forms.
3. To calculate the definite integral and the improper integral of a function on an interval.
4. To express concrete problems as differential equations and solve simple differential equations.
5. To calculate volumes, areas and lengths and draw two- and three-dimensional representations.
6. To analyze the convergence of infinite series.

Performance Criteria

- Proper use of concepts.
- Adequate two- and three-dimensional representations of surfaces and solids of revolution.
- Algebraic operations in conformity with rules.
- Correct choice and application of rules and techniques of integration.
- Accuracy of calculations.
- Justification of steps in the solution.
- Correct interpretation of results.
- Use of appropriate terminology.

Learning Activities

Field of study:	Science
Discipline:	Mathematics
Weighting:	3-2-3
Number of credits:	2 2/3
Number of contact hours:	75

Specific 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.
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Objective

Standard

Statement of the Competency

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

Elements of the Competency

1. To express concrete problems as linear equations.
2. To solve systems of linear equations using matrices.
3. To establish connections between geometry and algebra.
4. To determine the equation of geometric loci (straight lines and planes) and find their intersections.
5. To calculate angles, lengths, areas and volumes.
6. To demonstrate propositions.
7. To make two- and three-dimensional drawings of loci.

Performance Criteria

- Proper use of concepts.
- Representation of situations in terms of vectors and matrices.
- Correct application of algorithms.
- Correct solution of systems of linear equations.
- Adequate representation of loci.
- Justification of the steps in the solution.
- Algebraic operations in conformity with rules.
- Accuracy of calculations.
- Correct interpretation of results.
- Use of appropriate terminology.

Learning Activities

Field of study: Science
Discipline: Mathematics
Weighting: 3-2-3
Number of credits: 2 2/3
Number of contact hours: 75

Specific 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

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

Elements of the Competency

1. To describe the translation and rotation motions of bodies.
2. To apply the concepts and laws of dynamics to the analysis of the motion of bodies.
3. To measure the amount of work and energy involved in simple situations.
4. To apply the principles of conservation in mechanics.
5. To verify experimentally a number of laws and principles in mechanics.

Performance Criteria

- 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

Field of study: Science
Discipline: Physics
Weighting: 3-2-3
Number of credits: 2 2/3
Number of contact hours: 75

Specific 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

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

Elements of the Competency

1. To analyze situations in physics associated with static electric charge and electric current.
2. To analyze situations in physics associated with magnetism and magnetic induction.
3. To apply the laws of electricity and magnetism.
4. To 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

Field of study: Science
Discipline: Physics
Weighting: 3-2-3
Number of credits: 2 2/3
Number of contact hours: 75

Specific 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

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

Elements of the Competency

1. To apply the basic principles of physics to the description of vibrations and waves and their transmission.
2. To apply the laws of geometric optics.
3. To apply the characteristics of waves to light phenomena.
4. To analyze a number of situations using concepts of modern physics.
5. To verify experimentally a number of laws and principles associated with waves, optics and modern physics.

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 main models.
- Critical evaluation of results.
- Interpretation of the limits of the models.
- Meticulous experimentation.
- Laboratory report in line with established standards.

Learning Activities

Field of study:	Science
Discipline:	Physics
Weighting:	3-2-3
Number of credits:	2 2/3
Number of contact hours:	75

Specific 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.
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Objective

Standard

Statement of the Competency

To apply basic concepts in discrete mathematics to problem solving.

Elements of the Competency

1. To apply concepts of set theory and logic.
2. To develop the steps of a simple mathematical proof.
3. To apply the rules and concepts of modular arithmetic and number systems.
4. To use the elementary principles of enumeration.
5. To define a recursive function.
6. To find the solution of a function defined by a second order linear recurrence equation.
7. To draw graphs to represent a situation.

Performance Criteria

- Appropriate use of concepts.
- Appropriate use of Boolean algebra to design a logical circuit.
- Correct choice and application of proof techniques.
- Correct use of Euclid's algorithm and modular arithmetic.
- Appropriate use of counting formulas for problem solving.
- Correct conversion of integers between different bases.
- Correct solution of a second order linear recurrence equation.
- Appropriate knowledge of graph-related terminology.
- Correct determination and use of a graph's adjacency matrix.

Learning Activities

Discipline: Mathematics
Weighting: 3-2-3
Number of credits: 2 2/3
Number of contact hours: 75

Specific 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).

Objective

Standard**Statement of the Competency**

To develop programs to solve simple problems.

Elements of the Competency

1. To develop algorithmic solutions to simple problems.

Performance Criteria

- Accurate analysis of the situation with respect to available data, the desired results and the processing required.
- Design of an effective algorithm.
- Proper validation of an algorithm by means of a complete set of tests.

2. To use a programming language.

- Accurate recognition of the characteristics and functions of a computer and its network.
- Correct use of a work station in a development environment.
- Correct algorithm translation.
- Strict application of programming standards.
- Effective use of the development environment's functions in searching for and correcting compilation errors.
- Correct application of the set of tests required to check the program's operation.
- Appropriate debugging of the program according to the algorithm.
- Accurate comprehension of the basic concepts of object-oriented programming: class, object, method, attribute.

Learning Activities

Discipline: Computer Science
Weighting: 2-3-3
Number of credits: 2 2/3
Number of contact hours: 75

Objective

Statement of the Competency

To organize and manipulate data.

Elements of the Competency

1. To apply an object-oriented development approach.
2. To organize the data logically.
3. To manipulate data in memory.
4. To manipulate data in files.

Standard

Achievement Context

For programs to be developed and already developed.

Performance Criteria

- Correct understanding of the basic principles of object-oriented programming.
- Rigorous application of object-oriented programming principles and techniques: encapsulation, inheritance, polymorphism.
- Correct analysis of the context for using the data.
- Sound comparison of the possibilities offered by different data structures.
- Choice suited to the context of the data structures.
- Correct implementation of chosen data structures.
- Correct use of updating, sorting and search techniques with data in memory.
- Correct use of basic file data storage techniques: reading and writing.

Learning Activities

Discipline:	Computer Science
Weighting:	2-3-3
Number of credits:	2 2/3
Number of contact hours:	75

Objective

Statement of the Competency

To design and develop programs in a graphic environment.

Elements of the Competency

1. To establish the program functions.

2. To design the program.

3. To develop the program.

Standard

Achievement Context

In an object-oriented programming environment.

Performance Criteria

- Clarification of the basic goal of the program.
- Appropriate determination of the program's functional requirements.
- Appropriate determination of the user interface requirements.
- Design of a functional and user-friendly interface.
- Appropriate organization of data for implementing the program functions.
- Correct determination of processing required for implementing the program functions.
- Correct application of the principles of the object-oriented approach.
- Correct implementation of the user interface.
- Appropriate use of program libraries.
- Appropriate programming of modules.
- Rigorous validation of proper program operation.

Learning Activities

Discipline:	Computer Science
Weighting:	2-3-3
Number of credits:	2 2/3
Number of contact hours:	75

Objective

Statement of the Competency

To demonstrate their integration of the learning in the *Computer Science and Mathematics* program.

Elements of the Competency

1. To recognize the contribution of all subjects to their education.
2. To apply the knowledge they have acquired to a new or complex situation.
3. To develop a scientific computer application that integrates the knowledge they have acquired.
4. To evaluate, working alone, the integration procedure used.

Standard

Achievement Context

Through a team project.
Through an oral presentation and a written production.

Performance Criteria

- Meaningful summary of what they have learned.
- Suitable justification of the relevance of their learning.
- Adequate integration of at least two science subjects, including computer science.
- Appropriate use of the knowledge they have acquired.
- Appropriate demonstration of the novelty or complexity of the situation.
- Establishment of the comprehensive general framework of the team project.
- Precise definition of the problem to be solved.
- Accurate description of the solution.
- Appropriate implementation of the solution.
- Appropriate validation of results obtained.
- Clear communication of the results of the procedure, orally and in writing.
- Precise description of the procedure used in their integration project.
- Explicit reference to the learning that is considered important for solving the problems encountered in carrying out this project.
- Appropriate analysis of the strengths and weaknesses of the project.
- Relevant indication of repercussions of the project.
- Suitable evaluation of their contribution to the team effort.

Learning Activities

Discipline: Computer Science
Weighting: 1-4-3
Number of credits: 2 2/3
Number of contact hours: 75

