

04

ARTS

INDUSTRIAL DESIGN TECHNIQUES

PROGRAM OF STUDY
570.C0

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Type of certification: Diploma of college studies

Number of credits : 91 2/3

Total duration: 2 670 hours of instruction

General education component:	660 hours of instruction
Program-specific component:	2 010 hours of instruction

Specific admission requirements:

- Mathematics 436
- Physics 534

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INTRODUCTION TO THE PROGRAM

The *Industrial Design Techniques* program shares the aims and goals for technical education that serve as guidelines for the Direction générale de la formation professionnelle et technique. It was designed in accordance with the framework for developing technical programs, which emphasizes partnership and cooperation between the business and education communities.

This program is defined in terms of competencies, which are broken down into objectives and standards. The program shall provide a basis for the development of learning activities and their evaluation, since it is based on training needs, the employment situation and the general goals of technical education. Furthermore, it supports the application of a program approach.

The *Industrial Design Techniques* program includes a general education component that is common to all programs of study (16 2/3 credits), a general education component that is specific to the program (6 credits), a general education component that is complementary to the other components (4 credits) and a program-specific component (65 credits).

Part One of this document presents an overview of the program. Part Two describes the objectives and standards of the general education components and the program-specific component.

VOCABULARY USED

Program

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

Competency

For the specific program component of a technical program: an integrated set of cognitive and psychomotor skills and socio-affective behaviours that enable a student to exercise a role or function, perform a task or carry out an activity at entry level on the job market (*Cadre technique d'élaboration de la partie ministérielle des programmes d'études techniques*, p. 3).

Objective

The competency, skills or knowledge to be acquired or mastered (*College Education Regulations*, section 1).

Statement of the competency

For the specific program component of a technical program, the statement of the competency is the result of an analysis of the work situation, the general goals of technical education and, in certain cases, other factors. It consists of an action verb and an object. It must be clear and unequivocal.

For the general education component, the statement of the competency is the result of an analysis of the needs of general education.

Elements of the competency

For the specific program component of a technical program, the elements of the competency include only what is necessary in order to understand the competency. They specify the major steps in exercising the competency or the essential elements of the competency.

For the general education component, the elements of the objective, formulated in terms of a competency, specify the essential elements of the competency. They include only what is necessary in order to understand and attain the competency.

Standard

The level of performance at which an objective is considered to be achieved (*College Education Regulations*, section 1).

Achievement context

For the specific program component of a technical program, the achievement context corresponds to the situation in which the competency is exercised at entry level on the job market. The achievement context does not specify the context for learning or evaluation.

Performance criteria

For the specific program component of a technical program, the performance criteria define the requirements that make it possible to judge the attainment of each of the elements of the competency and consequently of the competency itself. The performance criteria are based on the requirements at entry level on the job market. The performance criteria are not the evaluation instrument but, rather, they serve as a reference for the development of the evaluation instrument. Each element of the competency requires at least one performance criterion.

For the general education component, the performance criteria define the requirements for recognition of the attainment of the standard. All the criteria must be respected for the objective to be attained.

Learning activities

For the specific program component of a technical program, the learning activities are classes (labs, workshops, seminars, practicums or other educational activities) designed to ensure the attainment of the targeted objectives and standards. Colleges are entirely responsible for defining the learning activities and applying the program-based approach.

For the general education component, the elements of the learning activities that may be determined in whole or in part by the Minister are the field of study, the discipline(s), the weightings, the total hours of instruction, the number of credits and any details deemed essential.

PART ONE

GOALS OF THE PROGRAM

The *Industrial Design Techniques* program is intended to train people to practise the profession of industrial design technician.

Industrial design technicians are qualified to work in a variety of processing and manufacturing enterprises, particularly those relating to furniture, machinery and equipment, pulp and paper, lighting fixtures, telecommunications and plastic products. They can also work in offices devoted to design, architecture or engineering, as well as in other service positions. Finally, they may work as freelancers or run their own businesses.

The duties of industrial design technicians fall within the process used to develop—that is, to improve or modify—existing products and, occasionally, to design new products. Their professional responsibilities vary in accordance with the type and size of the company for which they work. Generally, the tasks of the industrial design technician are integrated with the company's other activities. They are carried out in multidisciplinary teams comprised of different types of professionals and, more specifically, complement the work of industrial designers or project managers.

In carrying out their duties, industrial designers apply a problem-solving approach that comprises the following steps: assimilating initial information about the project, planning the work, doing additional project research, defining a framework for product development and devising, evaluating and presenting solutions.

In accordance with the general goals of general and technical education, the aims of the program-specific component of the *Industrial Design Techniques* program are :

- to enable students to acquire competence in the exercise of the profession, to perform the functions and carry out the tasks and activities of the profession at a level acceptable for entry into the job market;

- to help students integrate into working life by giving them a general knowledge of the job market, as well as an understanding of the particular work environment of the industrial design technician;

- to foster the students' personal growth and continuing professional development;

- to provide for students' future job mobility by helping them to acquire career-management skills.

The *Industrial Design Techniques* program makes it possible to achieve the educational aims of the common, specific and complementary components of general education.

THE GOALS OF GENERAL EDUCATION

In Québec, college is the next stage after the compulsory years of schooling (elementary and secondary school) during which students acquire basic knowledge and skills. It represents a major crossroads in that there is greater emphasis on the cultural aspect of academic subjects and leads students directly to the labour market or to university. The college system is responsive to current needs with respect to technical and pre-university education. It allows students to further their education without, however, narrowing their options, since they may switch from one type of program to the other. Finally, it provides students with a well-rounded, balanced education.

Each college program features a general education component that is common to all programs, one that is adapted to the specific field of study, and one that is complementary. The goals of general education are to provide students with a common cultural core, to help them learn and develop generic skills, and to foster desirable attitudes. The desired outcomes are to educate students, to prepare them for their role as responsible members of society and to enable them to share in the common cultural heritage.

The common cultural core

Transmission of the common cultural core is aimed at allowing students to develop or acquire the following:

- mastery of the language of instruction as a tool for communication and reflection, and mastery of the basic rules of rational thought, discourse and argumentation;
- the ability to communicate in other languages, primarily French or English;
- openness to the world and to cultural diversity;
- appreciation of the riches of their cultural heritage through familiarization with the accomplishments of human civilization;
- the ability to situate themselves with respect to the major schools of thought;
- the ability to think critically, independently and reflectively;
- personal and social ethics;
- mastery of knowledge relevant to the development of physical and intellectual well-being;
- awareness of the need to develop habits conducive to good health.

Generic skills

General education allows students to acquire and develop the following generic skills:

- conceptualization, analysis and synthesis;
- coherent reasoning;
- critical judgment;
- articulate expression;
- the ability to apply what they have learned in analyzing situations;

- the ability to apply what they have learned in determining appropriate action;
- mastery of work methods;
- the ability to reflect on what they have learned.

Desirable attitudes

Cultural literacy and generic skills help students to acquire and develop the following attitudes:

- autonomy;
- a critical sense;
- awareness of their responsibilities toward themselves and others;
- openmindedness;
- creativity;
- openness to the world.

These outcomes apply to the three general education components, more specifically:

- General education common to all programs, which is allotted 16 2/3 credits distributed as follows:
 - language of instruction and literature: 7 1/3 credits;
 - humanities or *philosophie*: 4 1/3 credits;
 - physical education: 3 credits;
 - second language: 2 credits.
- General education adapted to programs, which introduces tasks or learning situations that are relevant to the field of study. The breakdown of credits, for a total of 6, is as follows:
 - language of instruction and literature: 2 credits;
 - humanities or *philosophie*: 2 credits;
 - second language: 2 credits.
- Complementary general education, which allows students to complete their training with learning activities chosen with a view to achieving balance and complementarity in relation to the program-specific component. Students may choose courses for a total of 4 credits in the following areas:
 - social sciences;
 - science and technology;
 - modern languages;
 - mathematics literacy and computer science;
 - art and aesthetics.

The general and the specific education components are designed to contribute to students' education in an integrative fashion. In other words, the knowledge and skills transmitted in one component are reinforced and, whenever possible, reapplied in the other.

Each college-level institution must provide such general education through learning activities that are consistent with its educational project, within the framework of the stated outcomes, the given subject areas and ministerial guidelines.

All the sets of objectives and standards in the general education component are developed in keeping with the provisions of the *College Education Regulations* (R.S.Q., c. C-29, s. 18; 1993, c. 25, s. 11). Revised Edition, August 1998.

EDUCATIONAL INTENTIONS OF GENERAL EDUCATION

The educational intentions explain in detail the contribution of each field of studies included in the three components of general education (common to all programs, adapted to programs or complementary) to the achievement of the goals of general education. For the first two components, the educational intentions include a general statement of the role of each field of studies, the principles which underlie this role, the contribution of each field, in the form of outcome objectives, to the achievement of the goals of general education in terms of knowledge, abilities and attitudes, and an explanation of the sequence of objectives and standards.

The integral text of the educational intentions is at the end of this document.

LIST OF PROGRAM OBJECTIVES

GENERAL EDUCATION COMMON TO ALL PROGRAMS

(16 2/3 credits)

- 0004 To analyze and produce various forms of discourse.
- 0005 To apply a critical approach to literary genres.
- 0006 To apply a critical approach to a literary theme.
- 00B2 To apply a logical analytical process to how knowledge is organized and used.
- 000G To apply a critical thought process to world views.
- 0017 Appliquer les notions de base de la communication en français courant.
or
- 000A Communiquer en français avec une certaine aisance.
or
- 000B Communiquer avec aisance en français.
or
- 000C Traiter d'un sujet culturel et littéraire.
- 0064 To establish the role that being physically active plays amongst the lifestyle behaviours which promote health.
- 0065 To improve one's effectiveness when practising a physical activity.
- 0066 To demonstrate one's responsibility for being physically active in a manner which promotes health.

GENERAL EDUCATION ADAPTED TO PROGRAMS**(6 credits)**

000L To communicate in the forms of discourse appropriate to one or more fields of study.

000U To apply a critical thought process to ethical issues relevant to the field of study.

0018 Appliquer des notions fondamentales de la communication en français, liées à un champ d'études.
or

000Q Communiquer en français dans un champ d'études particulier.

or

000R Communiquer avec aisance en français dans un champ d'études particulier.

or

000S Dissserter en français sur un sujet lié au champ d'études.

COMPLEMENTARY GENERAL EDUCATION**(4 credits)**

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.

SPECIFIC PROGRAM COMPONENT**(65 credits)**

- 0108 To analyze the job description.
- 0109 To analyze an industrially manufactured product.
- 010A To collect information for the purpose of developing a product.
- 010B To define design criteria.
- 010C To develop a product concept.
- 010D To use rendering tools.
- 010E To make technical drawings.
- 010F To produce mock-ups.
- 010G To undertake the technical development of a product.
- 010H To use industrial manufacturing technologies.
- 010J To advise a client on the formal and aesthetic dimensions of a product.
- 010K To study the relationship between the user and the product from an ergonomic perspective.
- 010L To enhance a product's use potential.
- 010M To analyze the structure of an object.
- 010N To improve the ways in which a product functions.
- 010P To offer professional services.
- 010Q To ensure that a product is technically feasible.
- 010R To advise the client with respect to the economic aspects of a product.
- 010S To produce technical documentation for the production phase.
- 010T To carry out technical and functional validation.

PART TWO

**OBJECTIVES AND STANDARDS -
GENERAL EDUCATION COMMON TO ALL
PROGRAMS**

OBJECTIVE	STANDARD
Statement of the competency To analyze and produce various forms of discourse. Elements 1 To identify the characteristics and functions of the components of discourse. 2 To determine the organization of facts and arguments of a given discourse. 3 To prepare ideas and strategies for a projected discourse. 4 To formulate a discourse. 5 To edit the discourse.	Performance criteria 1.1 Accurate explanation of the denotation of words. 1.2 Adequate recognition of the appropriate connotation of words. 1.3 Accurate definition of the characteristics and function of each component. 2.1 Clear and accurate recognition of the main idea and structure. 2.2 Clear presentation of the strategies employed to develop an argument or thesis. 3.1 Appropriate identification of topics and ideas. 3.2 Adequate gathering of pertinent information. 3.3 Clear formulation of a thesis. 3.4 Coherent ordering of supporting material. 4.1 Appropriate choice of tone and diction. 4.2 Correct development of sentences. 4.3 Clear and coherent development of paragraphs. 4.4 Formulation of a 750-word discourse. 5.1 Thorough revision of form and content.
LEARNING ACTIVITIES	
Discipline : English Weighting : 2-2-4, 1-3-4 Credits : 2 2/3	

GENERAL EDUCATION COMMON TO ALL PROGRAMS : LANGUAGE OF INSTRUCTION AND LITERATURE		CODE : 0005
OBJECTIVE		STANDARD
Statement of the competency To apply a critical approach to literary genres. Elements 1 To distinguish genres of literary discourse. 2 To recognize the use of literary conventions within a specific genre. 3 To situate a discourse within its historical and literary period. 4 To explicate a discourse representative of a literary genre.		Performance criteria 1.1 Clear recognition of the formal characteristics of a literary genre. 2.1 Accurate recognition of the figurative communication of meaning. 2.2 Adequate explanation of the effects of significant literary and rhetorical devices. 3.1 Appropriate recognition of the relationship of a text to its period. 4.1 Selective use of appropriate terminology. 4.2 Effective presentation of a 1000-word integrated response to a text.
LEARNING ACTIVITIES		
Discipline : English Weighting : 2-2-3 Credits : 2 1/3		

GENERAL EDUCATION COMMON TO ALL PROGRAMS : LANGUAGE OF INSTRUCTION AND LITERATURE		CODE : 0006
OBJECTIVE		STANDARD
Statement of the competency To apply a critical approach to a literary theme. Elements 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 text from a thematic perspective.		Performance criteria 1.1 Clear recognition of elements within the text which define and reinforce a theme and its development. 1.2 Adequate demonstration of the effects of significant literary and rhetorical devices. 2.1 Appropriate recognition of a text as an expression of cultural context. 2.2 Adequate demonstration of the effects of significant literary and rhetorical devices. 3.1 Appropriate identification of expression (explicit/implicit) of a value system in a text. 4.1 Selective use of an appropriate terminology. 4.2 Effective presentation of a 1000-word integrated response to a text.
LEARNING ACTIVITIES		
Discipline : English Weighting : 2-2-3 Credits : 2 1/3		

GENERAL EDUCATION COMMON TO ALL PROGRAMS : HUMANITIES CODE : 00B2	
OBJECTIVE	STANDARD
Statement of the competency To apply a logical analytical process to how knowledge is organized and used. Elements 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.	Performance criteria 1.1 Appropriate description of the basic elements. 1.2 Appropriate use of terminology relevant to fields of knowledge. 2.1 Adequate definition of the dimensions, limits, and uses of fields of knowledge. 3.1 Accurate identification of the main components in the historical development of fields of knowledge. 3.2 Accurate description of the effects of historical development and societal milieu on the limitations and uses of a field of knowledge. 4.1 Coherent organization of the main components. 5.1 Appropriate analysis of the components. 5.2 Coherent synthesis of the main components. 5.3 Appropriate expression, including a significant individual written component, of an analysis of the context, importance and implications of the organization and uses of knowledge.
LEARNING ACTIVITIES	
Discipline : Humanities Weighting : 3-1-3 Credits : 2 1/3	

GENERAL EDUCATION COMMON TO ALL PROGRAMS : HUMANITIES CODE : 000G	
OBJECTIVE	STANDARD
Statement of the competency To apply a critical thought process to world views. Elements 1 To describe world views. 2 To explain the major ideas, values, and implications of a world view. 3 To organize the ideas, values and experiences of a world view into coherent patterns. 4 To compare world views.	Performance criteria 1.1 Accurate description of a society or group with a distinctive world view. 1.2 Appropriate use of terminology relevant to these societies or groups. 2.1 Adequate explanation of the salient components of a world view. 3.1 Coherent organization of ideas about a world view. 3.2 Appropriate expression, including a significant individual written component, of an analysis of the context, importance, and implications of world views. 4.1 Comparative analysis of these world views. 4.2 Appropriate inclusion of central elements, relationships, and organizational principles of the societies or groups in the analysis.
LEARNING ACTIVITIES	
Discipline : Humanities Weighting : 3-0-3 Credits : 2	

FORMATION GÉNÉRALE COMMUNE : LANGUE SECONDE (NIVEAU I)CODE : 0017	
OBJECTIF	STANDARD
Énoncé de la compétence Appliquer les notions de base de la communication en français courant. Éléments 1 Dégager le sens d'un message oral simple. 2 Émettre un message oral simple. 3 Dégager le sens d'un texte. 4 Rédiger un texte simple.	Critères de performance 1.1 Repérage précis des difficultés de compréhension du message. 1.2 Utilisation pertinente des techniques d'écoute choisies. 1.3 Distinction précise du sens général et des idées essentielles du message. 1.4 Description précise du sens général et des idées essentielles du message. 2.1 Repérage précis des difficultés d'expression. 2.2 Utilisation pertinente des techniques d'expression orales choisies. 2.3 Emploi pertinent du vocabulaire courant. 2.4 Expression intelligible du propos. 3.1 Repérage précis des difficultés de compréhension du texte. 3.2 Utilisation pertinente des techniques de lecture choisies. 3.3 Distinction claire des principaux éléments du texte. 3.4 Description précise du sens général et des idées essentielles d'un texte de 500 mots. 4.1 Repérage précis des difficultés d'écriture. 4.2 Utilisation pertinente des techniques d'écriture choisies. 4.3 Emploi pertinent du vocabulaire courant. 4.4 Formulation claire et cohérente d'un texte de 100 mots.
LEARNING ACTIVITIES	
Discipline : Français, langue seconde Pondération : 2-1-3 Unités : 2	

FORMATION GÉNÉRALE COMMUNE : LANGUE SECONDE (NIVEAU II)		CODE : 000A
OBJECTIF		STANDARD
Énoncé de la compétence Communiquer en français avec une certaine aisance.		
Éléments 1 Interpréter un texte oral simple de trois minutes en français courant. 2 Produire un texte oral planifié de cinq minutes en français courant. 3 Interpréter un texte écrit en français courant. 4 Rédiger un texte simple en français courant.		Critères de performance 1.1 Distinction claire des principaux éléments du texte oral. 1.2 Explication précise du sens des mots dans le texte. 1.3 Repérage précis des idées et des sujets traités dans le texte. 2.1 Emploi pertinent du vocabulaire courant. 2.2 Respect du niveau de langue, du code grammatical et des règles de la prononciation. 2.3 Formulation claire et cohérente du propos. 3.1 Distinction claire des principaux éléments du texte. 3.2 Explication précise du sens des mots dans le texte. 3.3 Repérage précis des idées principales et de la structure d'un texte de 700 à 1000 mots. 4.1 Respect du code grammatical et orthographique. 4.2 Utilisation judicieuse des principaux éléments du corpus. 4.3 Formulation claire et cohérente des phrases. 4.4 Articulation cohérente des paragraphes. 4.5 Rédaction d'un texte de 200 mots.
LEARNING ACTIVITIES		
Discipline : Français, langue seconde Pondération : 2-1-3 Unités : 2		

FORMATION GÉNÉRALE COMMUNE : LANGUE SECONDE (NIVEAU III)		CODE : 000B
OBJECTIF		STANDARD
Énoncé de la compétence Communiquer avec aisance en français.		
Éléments 1 Produire un texte oral planifié de cinq minutes de complexité moyenne. 2 Commenter un texte écrit de complexité moyenne. 3 Rédiger un texte de complexité moyenne.		Critères de performance 1.1 Emploi pertinent du vocabulaire courant. 1.2 Adaptation à l'interlocuteur ou à l'interlocutrice. 1.3 Respect du niveau de langue, du code grammatical et des règles de la prononciation. 1.4 Formulation claire et cohérente du propos. 1.5 Agencement pertinent des idées. 2.1 Distinction claire des principaux éléments d'un texte comprenant entre 2 500 et 3 000 mots. 2.2 Explication précise du sens des mots dans le texte. 2.3 Distinction précise des idées principales et secondaires, des faits et des opinions. 2.4 Formulation d'éléments implicites. 3.1 Respect du code grammatical et orthographique. 3.2 Adaptation au lecteur ou à la lectrice. 3.3 Utilisation judicieuse des principaux éléments du corpus. 3.4 Formulation claire et cohérente des phrases, dont au moins trois sont complexes. 3.5 Articulation cohérente des paragraphes. 3.6 Rédaction d'un texte de 350 mots.
LEARNING ACTIVITIES		
Discipline : Français, langue seconde Pondération : 2-1-3 Unités : 2		

FORMATION GÉNÉRALE COMMUNE : LANGUE SECONDE (NIVEAU IV)		CODE : 000C
OBJECTIF		STANDARD
Énoncé de la compétence Traiter d'un sujet culturel et littéraire.		
Éléments 1 Analyser un texte culturel ou littéraire. 2 Rédiger un texte sur un sujet culturel ou littéraire.		Critères de performance 1.1 Formulation personnelle des éléments principaux du texte. 1.2 Inventaire des thèmes principaux. 1.3 Relevé d'indices qui permettent de situer le texte dans son contexte socioculturel et historique. 1.4 Repérage des valeurs véhiculées. 1.5 Repérage juste de la structure du texte. 1.6 Articulation claire d'un point de vue personnel. 2.1 Respect du sujet. 2.2 Respect du code grammatical et orthographique. 2.3 Adaptation au lecteur ou à la lectrice. 2.4 Utilisation judicieuse des principaux éléments du corpus. 2.5 Formulation claire et cohérente d'un texte de 500 mots. 2.6 Articulation claire d'un point de vue personnel.
LEARNING ACTIVITIES		
Discipline : Pondération : Unités :	Français, langue seconde 3-0-3 2	

GENERAL EDUCATION COMMON TO ALL PROGRAMS : PHYSICAL EDUCATION CODE : 0064	
OBJECTIVE	STANDARD
Statement of the competency To establish the role that being physically active plays amongst the lifestyle behaviours which promote health. Elements 1 To establish the relationship between one's lifestyle and one's health. 2 To be physically active in a manner which promotes health. 3 To recognize one's needs, abilities, and motivational factors with respect to being physically active on a regular basis. 4 To propose physical activities which promote health.	Performance criteria 1.1 Proper use of documentation. 1.2 Appropriate relationships between the main lifestyle behaviours and their impact on health. 2.1 Observance of the rules involved in the physical activity, including safety guidelines. 2.2 Respect of one's abilities when practising physical activities. 3.1 Appropriate use of the physical quantitative and qualitative data. 3.2 Statement of one's main physical needs and abilities. 3.3 Statement of one's main motivational factors with respect to being physically active on a regular basis. 4.1 Appropriate and justified choice of physical activities according to one's needs, abilities, and motivational factors.
LEARNING ACTIVITIES	
Discipline : Physical Education Weighting : 1-1-1 Credits : 1	

GENERAL EDUCATION COMMON TO ALL PROGRAMS : PHYSICAL EDUCATION CODE : 0065	
OBJECTIVE	STANDARD
Statement of the competency To improve one's effectiveness when practising a physical activity. Elements 1 To use a process designed to improve one's effectiveness in the practice of a physical activity.	Performance criteria 1.1 Initial assessment of one's abilities and attitudes when practising a physical activity. 1.2 Statement of one's expectations and needs with respect to one's ability to practise the activity. 1.3 Appropriate formulation of personal objectives. 1.4 Statement of the means to achieve one's objectives. 1.5 Observance of the rules involved in the physical activity, including safety guidelines. 1.6 Periodic evaluation of one's abilities and attitudes when practising a physical activity. 1.7 Meaningful interpretation of the progress achieved and the difficulties experienced during the activity. 1.8 Pertinent and periodic adjustments of objectives or action plan. 1.9 Appreciable improvement of the motor skills required by the activity.
LEARNING ACTIVITIES	
Discipline : Physical Education Weighting : 0-2-1 Credits : 1	

GENERAL EDUCATION COMMON TO ALL PROGRAMS : PHYSICAL EDUCATION		CODE : 0066
OBJECTIVE		STANDARD
Statement of the competency To demonstrate one's responsibility for being physically active in a manner which promotes health.		
Elements 1 To combine effective practice with a health promotional approach to physical activity. 2 To manage a personal physical activity program.		Performance criteria 1.1 Integration of effective practice with factors which promote health in the practice of a physical activity. 2.1 Statement of one's priorities according to the needs abilities, and motivational factors with respect to being active on a regular basis. 2.2 Proper formulation of objectives to achieve in one's personal program. 2.3 Appropriate choice of activity or activities for one's personal program. 2.4 Appropriate planning of how the activity or activities in the personal program are carried out. 2.5 Appropriate choice of criteria to measure program objective attainment. 2.6 Periodic statement of the time invested and the activities carried out during the program. 2.7 Meaningful interpretation of the progress achieved and difficulties experienced during the activity. 2.8 Appropriate and periodic adjustment of objectives or action plan.
LEARNING ACTIVITIES		
Discipline : Physical Education Weighting : 1-1-1 Credits : 1		

**OBJECTIVES AND STANDARDS -
GENERAL EDUCATION ADAPTED TO PROGRAMS**

GENERAL EDUCATION ADAPTED TO PROGRAMS : LANGUAGE OF INSTRUCTION AND LITERATURE		CODE : 000L
OBJECTIVE		STANDARD
Statement of the competency To communicate in the forms of discourse appropriate to one or more fields of study. Elements 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 formulate a discourse.		Performance criteria 1.1 Accurate recognition of specialized vocabulary and conventions. 1.2 Accurate recognition of the characteristics of the form of discourse. 2.1 Clear and accurate recognition of the main ideas and structure. 2.2 Appropriate distinction between fact and argument 3.1 Appropriate choice of tone and diction. 3.2 Correctly developed sentences. 3.3 Clearly and coherently developed paragraphs. 3.4 Appropriate use of program-related communication strategies. 3.5 Formulation of a 1000-word discourse. 3.6 Thorough revision of form and content.
LEARNING ACTIVITIES		
Discipline : English Total Contact Hours : 60 Credits : 2		

GENERAL EDUCATION ADAPTED TO PROGRAMS : HUMANITIES		CODE : 000U
OBJECTIVE		STANDARD
Statement of the competency To apply a critical thought process to ethical issues relevant to the field of study. Elements 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 1.1 Accurate recognition of the basic elements of ethical issues. 1.2 Appropriate use of relevant terminology. 1.3 Adequate identification of the main linkages with world views and fields of knowledge. 2.1 Adequate description of the salient components of the issues. 3.1 Coherent organization of the ethical questions and their implications. 3.2 Appropriate expression, including a significant individual written component, of an analysis of the context, importance and implications of the issues. 4.1 Adequate development of substantiated argumentation including context and diverse points of view. 4.2 Clear articulation of an individual point of view.
LEARNING ACTIVITIES		
Discipline : Humanities Total Contact Hours : 45 Credits : 2		

FORMATION GÉNÉRALE PROPRE : LANGUE SECONDE (NIVEAU I)		CODE : 0018
OBJECTIVE		STANDARD
Énoncé de la compétence Appliquer des notions fondamentales de la communication en français, liées à un champ d'études. Elements 1 Dégager le sens d'un message oral simple lié à un champ d'études. 2 Dégager le sens et les caractéristiques d'un texte lié à un champ d'études. 3 Émettre un message oral simple lié à un champ d'études. 4 Rédiger un court texte lié à un champ d'études.		Performance criteria 1.1 Repérage précis des difficultés de compréhension du message. 1.2 Distinction juste des caractéristiques du message. 1.3 Repérage juste du vocabulaire spécialisé. 1.4 Utilisation pertinente des techniques d'écoute choisies. 1.5 Distinction claire des principaux éléments du message. 1.6 Description précise du sens général et des idées essentielles du message. 2.1 Repérage précis des difficultés de compréhension du texte. 2.2 Distinction juste des caractéristiques du texte. 2.3 Repérage précis du vocabulaire spécialisé. 2.4 Utilisation pertinente des techniques de lectures choisies. 2.5 Distinction claire des principaux éléments du texte. 2.6 Description précise du sens général et des idées essentielles du texte. 3.1 Repérage précis des difficultés d'expression orale. 3.2 Utilisation pertinente des techniques d'expression orale choisies. 3.3 Utilisation pertinente du vocabulaire courant et spécialisé. 3.4 Expression intelligible du propos. 4.1 Repérage précis des difficultés d'écrire. 4.2 Utilisation pertinente des techniques d'écriture choisies. 4.3 Utilisation pertinente du vocabulaire courant et spécialisé. 4.4 Formulation claire et cohérente du texte.
ACTIVITÉS D'APPRENTISSAGE		
Discipline :		Français, langue seconde
Nombre d'heures-contact :		45
Nombre d'unités :		2

FORMATION GÉNÉRALE PROPRE : LANGUE SECONDE (NIVEAU II)		CODE : 000Q
OBJECTIVE		STANDARD
Énoncé de la compétence Communiquer en français dans un champ d'études particulier.		
Elements 1 Distinguer les types de textes propres au champ d'études. 2 Interpréter des textes représentatifs du champ d'études. 3 Utiliser des techniques de production de textes appropriées au champ d'études.		Performance criteria 1.1 Distinction précise des caractéristiques formelles de chacun des principaux types de textes et des conventions utilisées. 2.1 Distinction claire des principaux éléments du texte. 2.2 Interprétation claire du vocabulaire spécialisé. 2.3 Repérage précis des idées et des sujets traités. 2.4 Utilisation pertinente des techniques de lecture et d'écoute. 3.1 Emploi pertinent du vocabulaire spécialisé et des conventions. 3.2 Respect du niveau de langue et du code grammatical. 3.3 Formulation claire et cohérente du propos. 3.4 Utilisation pertinente des techniques d'expression.
ACTIVITÉS D'APPRENTISSAGE		
Discipline : Français, langue seconde Nombre d'heures-contact : 45 Nombre d'unités : 2		

**OBJECTIVES AND STANDARDS -
COMPLEMENTARY GENERAL EDUCATION**

COMPLEMENTARY GENERAL EDUCATION: SOCIAL SCIENCES		CODE: 000V
OBJECTIVE		STANDARD
Statement of the competency To estimate the contribution of the social sciences to an understanding of contemporary issues. Elements 1 Recognize the focus of one or more of the social sciences and their main approaches. 2 Identify some of the issues currently under study in the social sciences. 3 Demonstrate the contribution of one or more 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. Performance criteria 1.1 Formulation of the focus specific to one or more of the social sciences. 1.2 Description of the main approaches used in the social sciences. 2.1 Association of issues with the pertinent areas of research in the social sciences. 3.1 Presentation of contemporary issues by emphasizing the interpretation of the social sciences. 3.2 Illustration of the interaction between certain social changes and the contribution of the social sciences.
LEARNING ACTIVITIES		
Number of student-contact hours :		45
Number of credits :		2

COMPLEMENTARY GENERAL EDUCATION: 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 - Formulate a problem using one or more social scientific approaches. - Deal with an issue using one or more social scientific approaches. - Draw conclusions.		Performance criteria 1.1 Presentation of the background to the problem. 1.2 Use of appropriate concepts and language. 1.3 Brief description of individual, collective, spatio-temporal and cultural aspects of the problem. 2.1 Clear formulation of an issue. 2.2 Selection of pertinent reference materials. 2.3 Brief description of historical, experimental and survey methods. 3.1 Appropriate use of the selected method. 3.2 Determination of appropriate evaluation criteria. 3.3 Identification of strengths and weaknesses of the conclusions.
LEARNING ACTIVITIES		
Number of student-contact hours : 45 Number of credits : 2		

COMPLEMENTARY GENERAL EDUCATION: 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. Elements 1 Describe the standard scientific mode of thought and method. 2 Demonstrate how science and technology are complementary. 3 Explain the context and the stages related to several scientific and technological discoveries. 4 Deduce different consequences and questions resulting from certain recent scientific and technological developments.	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. Performance criteria 1.1 Brief description of the essential characteristics of the scientific mode of thought, including quantification and demonstration. 1.2 Organized list and brief description of the essential characteristics of the main steps in the standard scientific method. 2.1 Definition of terms and description of the primary ways in which science, techniques and technology are interrelated: logical and temporal connections, and mutual contributions. 3.1 Pertinent and coherent explanation of the relationship between the determining contexts related to several scientific and technological discoveries. 3.2 List of the main stages of scientific and technological discoveries. 4.1 Brief description of important consequences (of different types) and the current major challenges resulting from several scientific and technological discoveries. 4.2 Formulation of relevant questions and credibility of responses to the questions formulated.
LEARNING ACTIVITIES	
Number of student-contact hours : 45 Number of credits : 2	

COMPLEMENTARY GENERAL EDUCATION: SCIENCE AND TECHNOLOGY CODE: 000Y	
OBJECTIVE	STANDARD
Statement of the competency To resolve a simple problem by applying the basic scientific method. Elements 1 Describe the main steps of the standard scientific method. 2 Formulate a hypothesis designed to solve a simple scientific and technological problem. 3 Verify a hypothesis by applying the fundamental principles of the basic experimental 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. Performance criteria 1.1 Organized list and brief description of the characteristics of the steps of the standard scientific method. 2.1 Clear, precise description of the problem. 2.2 Observance of the principles for formulating a hypothesis (observable and measurable nature of data, credibility, etc.). 3.1 Pertinence, reliability and validity of the experimental method used. 3.2 Observance of established experimental method. 3.3 Appropriate choice and use of instruments. 3.4 Clear, satisfactory presentation of results. 3.5 Validity of the connections established between the hypothesis, the verification and the conclusion.
LEARNING ACTIVITIES	
Number of student-contact hours : 45 Number of credits : 2	

COMPLEMENTARY GENERAL EDUCATION: MODERN LANGUAGES		CODE: 000Z
OBJECTIVE		STANDARD
Statement of the competency To communicate with limited skill* in a modern language. (*This refers to the limited use of language structures, grammar and vocabulary. This limitation varies depending on the complexity of the modern language.) Elements 1 Understand the meaning of a verbal message. 2 Understand the meaning of a written message. 3 Express a simple message verbally. 4 Write a text on a given subject.		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. Performance criteria 1.1 The acquisition of a modern language requires an awareness of the culture of the people who use the language. 1.2 Accurate identification of words and idiomatic expressions. 1.3 Clear recognition of the general meaning of simple messages. 1.4 Logical connection between the various elements of the message. 2.1 Accurate identification of words and idiomatic expressions. 2.2 Clear recognition of the general meaning of simple messages. 2.3 Logical connection between the various elements of the message. 3.1 Appropriate use of language structures in main and coordinate clauses. 3.2 Appropriate application of grammar rules. 3.3 Use of verbs in the present indicative. 3.4 Appropriate use of basic vocabulary and idiomatic expressions. 3.5 Understandable pronunciation. 3.6 Coherent sequence of simple sentences. 3.7 Spontaneous and coherent sequence of sentences during a conversation. 4.1 Appropriate use of language structures in main and coordinate clauses. 4.2 Appropriate application of basic grammar rules. 4.3 Use of verbs in the present indicative. 4.4 Appropriate use of basic vocabulary and idiomatic expressions. 4.5 Coherent sequence of simple sentences. 4.6 Acceptable application of graphic rules for writing systems other than the Latin alphabet.
LEARNING ACTIVITIES		
Number of student-contact hours :		45
Number of credits :		2

COMPLEMENTARY GENERAL EDUCATION: MODERN LANGUAGES		CODE: 0010
OBJECTIVE	STANDARD	
Statement of the competency To communicate on familiar topics in a modern language. Elements 1 Understand the meaning of a verbal message. 2 Understand the meaning of a written message. 3 Express a simple message verbally, using sentences of average complexity. 4 Write a text on a given subject, using sentences of average complexity.	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. Performance criteria The acquisition of a modern language requires an awareness of the culture of the people who use the language. 1.1 Accurate identification of words and idiomatic expressions. 1.2 Clear recognition of the general meaning and essential ideas of messages of average complexity. 1.3 Logical connection between the various elements of the message. 2.1 Accurate identification of words and idiomatic expressions. 2.2 Clear recognition of the general meaning and essential ideas of messages of average complexity. 2.3 Logical connection between the various elements of the message. 3.1 Appropriate use of language structures in main or subordinate clauses. 3.2 Appropriate application of grammar rules. 3.3 Use of verbs in the present indicative. 3.4 Appropriate use of enriched basic vocabulary and idiomatic expressions. 3.5 Understandable pronunciation. 3.6 Coherent sequence of sentences of average complexity. 3.7 Conversation 4.1 Appropriate use of language structures in main or subordinate clauses. 4.2 Appropriate application of grammar rules. 4.3 Use of verbs in the present and past indicative. 4.4 Appropriate use of enriched basic vocabulary and idiomatic expressions. 4.5 Coherent sequence of sentences of average complexity. 4.6 Acceptable application of graphic rules for writing systems other than the Latin alphabet.	
LEARNING ACTIVITIES		
Number of student-contact hours : : 45 Number of credits : 2		

COMPLEMENTARY GENERAL EDUCATION: MODERN LANGUAGES		CODE: 0067
OBJECTIVE		STANDARD
Statement of the competency To communicate with relative ease in a modern language. Elements 1 Understand the meaning of a verbal message in everyday language. 2 Understand the meaning of a text of average complexity. 3 Have a conversation on a subject. 4 Write a text of average complexity.		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. Performance criteria The acquisition of a modern language requires an awareness of the culture of the people who use the language. 1.1 Accurate explanation of the general meaning and essential ideas of the message. 1.2 Clear identification of structural elements of the language. 2.1 Accurate explanation of the general meaning and essential ideas of the text. 2.2 Clear identification of structural elements of the language. 3.1 Appropriate use of the structural elements of the language according to the message to be expressed. 3.2 Appropriate use of everyday vocabulary. 3.3 Accurate pronunciation and intonation. 3.4 Normal flow in a conversation in everyday language. 3.5 Coherence of the message expressed. 3.6 Pertinent responses to questions. 4.1 Appropriate use of the structural elements of the language according to the text to be written. 4.2 Accurate vocabulary. 4.3 Coherence of the text as a whole. 4.4 Observance of presentation and writing rules applicable to the text.
LEARNING ACTIVITIES		
Number of student-contact hours :		45
Number of credits :		2

COMPLEMENTARY GENERAL EDUCATION: MATHEMATICS LITERACY AND COMPUTER SCIENCE		CODE: 0011
OBJECTIVE	STANDARD	
Statement of the competency To recognize the role of mathematics or informatics in contemporary society. Elements 1 Demonstrate the acquisition of basic general knowledge of mathematics or informatics. 2 Describe the evolution of mathematics or informatics. 3 Recognize the contribution of mathematics or informatics to the development of other areas of knowledge. 4 Illustrate the diversity of mathematical or informatics applications. 5 Evaluate the impact of mathematics or informatics on individuals and organizations.	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. Performance criteria 1.1 Identification of basic notions and concepts. 1.2 Identification of main branches of mathematics or informatics. 1.3 Appropriate use of terminology. 2.1 Descriptive summary of several major phases. 3.1 Demonstration of the existence of important contributions, using concrete examples. 4.1 Presentation of a range of applications in various areas of human activity, using concrete examples. 5.1 Identification of several major influences. 5.2 Explanation of the way in which mathematics or informatics have changed certain human and organizational realities. 5.3 Recognition of the advantages and disadvantages of these influences.	
LEARNING ACTIVITIES		
Number of student-contact hours : 45 Number of credits : 2		

COMPLEMENTARY GENERAL EDUCATION: MATHEMATICS LITERACY AND COMPUTER SCIENCE		CODE: 0012
OBJECTIVE	STANDARD	
Statement of the competency To use various mathematical or computer concepts, procedures and tools for common tasks. Elements 1 Demonstrate the acquisition of basic functional knowledge in mathematics or informatics. 2 Select mathematical or computer tools and procedures on the basis of specific needs. 3 Use mathematical or computer tools and procedures to carry out tasks and solve problems. 4 Interpret the quantitative data or results obtained using mathematical or computer tools and procedures.	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. Performance criteria 1.1 Brief definition of concepts. 1.2 Correct execution of basic operations. 1.3 Appropriate use of terminology. 2.1 List of numerous possibilities available with mathematical and computer tools and procedures. 2.2 Analysis of concrete situations and recognition of the usefulness of mathematical or computer tools and procedures. 2.3 Appropriate choice according to needs. 3.1 Planned, methodical process. 3.2 Correct use of tools and procedures. 3.3 Satisfactory results, given the context. 3.4 Appropriate use of terminology specific to a tool or procedure. 4.1 Accurate interpretation, given the context. 4.2 Clear, precise formulation of the interpretation.	
LEARNING ACTIVITIES		
Number of student-contact hours : 45 Number of credits : 2		

COMPLEMENTARY GENERAL EDUCATION: ART AND AESTHETICS		CODE: 0013
OBJECTIVE	STANDARD	
Statement of the competency To consider various forms of art produced by aesthetic practices. Elements 1 Develop an appreciation for the dynamics of the imagination in art. 2 Describe art movements. 3 Give a commentary on a work of art.	Achievement context - Students will work alone. - They will use a specified work of art and write a commentary of approximately 750 words. Performance criteria 1.1 Precise explanation of a creative process connected to the construction of an imaginary universe. 2.1 Descriptive list of the main characteristics of three art movements from different eras, including a modern movement. 3.1 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 student-contact hours : 45 Number of credits : 2		

COMPLEMENTARY GENERAL EDUCATION: ART AND AESTHETICS		CODE: 0014
OBJECTIVE		STANDARD
Statement of the competency To produce a work of art. Elements 1 Recognize the primary forms of expression of an artistic medium. 2 Use the medium.		Achievement context - Students will work alone. - of the language and techniques specific to the medium selected. Performance criteria 1.1 Identification of specific features: originality, essential qualities, means of communication, styles, genres. 2.1 Personal, coherent use of elements of language. 2.2 Satisfactory application of artistic techniques. 2.3 Observance of the requirements of the method of production.
LEARNING ACTIVITIES		
Number of student-contact hours : 45 Number of credits : 2		

**OBJECTIVES AND STANDARDS -
SPECIFIC PROGRAM COMPONENT**

CODE : 0108	
OBJECTIVE	STANDARD
Statement of the Competency To analyze the job description. Elements of the Competency 1. To describe the job and its entry-level requirements. 2. To study the tasks and operations of the job. 3. To study the skills and behaviour required to do the job. 4. To analyze the influence of the industrial manufacturing environment on the practice of the profession.	Achievement Context • Using recent data on the profession and on companies in this sector of activity. • During visits to manufacturing companies and to design, architecture and engineering offices. Performance Criteria 1.1 Relevance of the information gathered. 1.2 Thorough study of the general characteristics of the job and its entry-level requirements. 1.3 Accurate recognition of the self-employment opportunities in this sector. 1.4 Accurate recognition of the different work environments and of the roles of the various people involved. 1.5 Accurate recognition of the different potential career paths. 2.1 Proper examination of the tasks, operating conditions and performance criteria associated with each task. 2.2 Correct determination of the relative importance of each task. 2.3 Correlation of the steps in the design process with the job tasks. 2.4 Relevant correlation of the tasks of technical staff with those of the project managers. 3.1 Relevance of the links established between skills and behaviour and the different job tasks. 4.1 Establishment of relevant links between the industrial manufacturing process and the design process. 4.2 Correlation of the various services offered by a manufacturing company and activities associated with the job.

CODE : 0108

5. To study the framework of the profession.

- 5.1 Accurate recognition of the role, powers and responsibilities of the various associations.
- 5.2 Thorough study of the work standards that apply to the profession.
- 5.3 Accurate recognition of the rights and responsibilities of employers and employees.
- 5.4 Thorough study of the code of professional ethics.

CODE : 0109	
OBJECTIVE	STANDARD
Statement of the Competency To analyze an industrially manufactured product. Elements of the Competency - To give an overall description of the product. - To specify the requirements associated with the use of the product. - To study how the product works. - To specify the manufacturing context.	Achievement Context - During the analysis of a design mandate. - Using: - technical documentation; - information provided by the company; - suppliers and manufacturers. - Working as part of a team. - Under the supervision of the project manager. Performance Criteria 1.1 Appropriate reading of the formal elements and their relationships. 1.2 Precise recognition of the materials, textures and finishes. 1.3 Complete identification of the product parts and the links between them. 1.4 Correct appreciation of the product's quality/price ratio. 2.1 Precise definition of the services provided by the product. 2.2 Appropriate recognition of types of users. 2.3 Complete listing of operations required to use the product. 2.4 Correct description of the context in which the product is used. 3.1 Precise recognition of the elements involved in the function of the product. 3.2 Accurate determination of the types of functional relations that exist among the elements. 4.1 Precise determination of the industrial manufacturing processes. 4.2 Listing of the main material resources required. 4.3 Precise recognition of the trades and occupations involved in the manufacturing process. 4.4 Correct evaluation of the company's production capacity.

CODE : 0109

5. To specify the market for which the product is intended.

5.1 Precise recognition of the product's position with respect to the competition.

5.2 Precise recognition of the client group characteristics.

5.3 Consideration of the product's life span.

5.4 Evaluation of the soundness of the company's marketing strategy.

6. To judge the qualities of the product.

6.1 Correct evaluation of the product's consistency, efficiency and relevance.

6.2 Use of appropriate terminology.

CODE : 010A	
OBJECTIVE	STANDARD
Statement of the Competency To collect information for the purpose of developing a product. Elements of the Competency 1. To become familiar with the data for the design project. 2. To plan the research. 3. To collect information on the company and the product. 4. To collect and classify the documentation. 5. To present the information.	Achievement Context • During a design project. • Using: - documentation on technical aspects and standards; - computer equipment and material; - information from suppliers, manufacturers etc. • Under the supervision of the project manager. Performance Criteria 1.1 Recognition of the elements of the project that determine the research to be carried out. 1.2 Detailed examination of the project data. 1.3 Appropriate recognition of the missing information. 1.4 Quality of communication with other people involved in the project. 1.5 Respect for confidentiality of information. 2.1 Relevant determination of research topics and sources of information. 2.2 Establishment of a realistic work schedule. 3.1 Effective use of research tools. 3.2 Thorough use of sources of information. 3.3 Demonstration of openness to current trends. 3.4 Quality of communication. 3.5 Relevance of the information gathered. 4.1 Accuracy of data classification. 4.2 Appropriate data synthesis. 5.1 Appropriate organization of information in relation to the nature of the project. 5.2 Quality of the presentation.

CODE : 010B	
OBJECTIVE	STANDARD
Statement of the Competency To define design criteria. Elements of the Competency 1. To discern the scope of the the design project. 2. To study the parameters to be considered when developing the product. 3. To analyze the company's product and comparable or identical products.	Achievement Context • During a design project. • Using: - documentation on technical aspects and standards; - computer equipment and material; - information from suppliers, manufacturers, etc. • Under the supervision of the project manager. Performance Criteria 1.1 Intensive study of technical information. 1.2 Relevant intepretation of the nature and objectives of the project. 1.3 Precise recognition of the project requirements. 1.4 Quality of two-way communication. 1.5 Respect for confidentiality of information. 2.1 Correct appreciation of the product development constraints. 2.2 Detailed study of the manufacturing environment. 2.3 Consideration of the economic context. 2.4 Functional organization of data. 3.1 Precise determination of the attributes and qualities of the product type. 3.2 Relevant study of the products' functional, technical and economic characteristics. 3.3 Constructive analysis of products. 3.4 Correct evaluation of the products' strengths, weaknesses and innovations. 3.5 Demonstration of curiosity and resourcefulness in the search for information.

CODE : 010B	
4. To determine the improvements to be made to the company's product.	4.1 Consideration of the project objectives. 4.2 Relevance and correctness of the analysis of elements likely to affect product quality. 4.3 Appropriate recognition of the characteristics transferable or applicable to the product to be developed. 4.4 Consideration of the later steps in the design process.
5. To translate the selected elements into design criteria.	5.1 Accurate determination of the functions and performance expected of the product. 5.2 Precise and concise wording of statements. 5.3 Proper priority attributed to the different criteria. 5.4 Appropriate organization of the design criteria.

CODE : 010C	
OBJECTIVE	STANDARD
Statement of the Competency To develop a product concept. Elements of the Competency 1. To prepare the conceptual research. 2. To proceed to the brainstorming phase. 3. To identify conceptual orientations.	Achievement Context • Based on: - a specifications book; - a work schedule; - descriptions of parts, or actual parts; - visual references; - documentation on technical aspects and standards; • With the use of conventional and computerized drawing equipment and material. Performance Criteria 1.1 Appropriate analysis of the specifications book. 1.2 Accurate determination of the design context and the important elements to be considered. 1.3 Collection of information that could be used in product concept ideation 1.4 Consideration of the project timetable. 2.1 Demonstration of spontaneity and open-mindedness. 2.2 Effective use of creative techniques. 2.3 Generation of varied, original and meaningful forms and ideas. 2.4 Creative use of representation tools 2.5 Convincing rendition of forms and ideas. 3.1 Selection of forms and ideas with real development potential. 3.2 Creative exploration and arrangement of forms and ideas. 3.3 Judicious elaboration of valid development leads. 3.4 Consideration of design criteria. 3.5 Demonstration of good judgment.

CODE : 010C

4. To formalize preliminary concepts.

- 4.1 Creative, intensive exploration of development leads.
- 4.2 Refinement of concepts considering the avenues explored.
- 4.3 Search for balance between the demands of originality and the effectiveness of the concept.
- 4.4 Harmonious integration of design criteria and the concepts developed.
- 4.5 Clear representation of the concept.

5. To present concepts for validation.

- 5.1 Appropriate use of representation tools.
- 5.2 Clear and consistent explanations of the links between the suggested concepts and the project objectives.
- 5.3 Demonstration of openness to criticism.
- 5.4 Effective cooperation in solving the problems encountered.

CODE : 010D	
OBJECTIVE	STANDARD
Statement of the Competency To use rendering tools. Elements of the Competency 1. To analyze the rendering objectives. 2. To plan the work. 3. To render a virtual model. 4. To appropriately render the surface areas. 5. To convey the effects of light and shadow.	Achievement Context • Representing the formal and technical attributes of an object. • Using: - drawing instruments and material; - computer equipment and drawings and 3D modeling software. • Under the supervision of the project manager. Performance Criteria 1.1 Accurate interpretation of needs. 1.2 Precise recognition of the categories of information to be communicated. 1.3 Appropriate choice of communication strategies. 1.4 Consideration of the work schedule. 2.1 Appropriate choice of drawing techniques. 2.3 Appropriate choice of equipment and material. 2.3 Development of an appropriate execution sequence and schedule. 3.1 Appropriate choice of views. 3.2 Appropriate choice of viewing angle. 3.3 Determination of an appropriate strategy for constructing the object. 3.4 Relevant contextualization of the object. 4.1 Convincing depiction of the qualities of the object. 4.2 Clear representation of the technical characteristics of the object. 4.3 Respect for work techniques. 5.1 Appropriate choice of the direction of the light source. 5.2 Precise definition of light and shadow areas. 5.3 Precise definition of the intensity of light and shadow areas. 5.4 Proper application of tone gradations.

CODE : 010D	
6. To finalize the rendering.	6.1 Appropriate layout of images and texts. 6.2 Relevance of notes. 6.3 Quality of the mounting. 6.4 Appropriate choice of copying techniques.

CODE : 010E	
OBJECTIVE	STANDARD
Statement of the Competency To make technical drawings. Elements of the Competency 1. To plan the work. 2. To create assembly views. 3. To draw the parts.	Achievement Context • For the technical development and manufacturing of a product. • Using: - sketches, diagrams, models and parts; - technical information, either printed or digital; - drawing and 3D modelling software. • Under the supervision of the project manager. Performance Criteria 1.1 Accurate recognition of the usefulness of the drawings to be done and the information to be communicated. 1.2 Appropriate choice of work tools. 1.3 Appropriate choice of formats, scales and system of reference. 1.4 Proper description and numbering of the parts. 1.5 Appropriate arrangement of views. 1.6 Establishment of an appropriate production sequence and schedule. 2.1 Determination of the type and number of views required to describe the product. 2.2 Verification of the compatibility of the parts. 2.3 Respect for the prescribed standards and rules. 2.4 Precision of assemblies and drawings. 2.5 Relevance of the notations. 3.1 Determination of the type and number of views required to describe the piece. 3.2 Precision of detail required to shape the pieces. 3.3 Rigorous application of concepts in geometry. 3.4 Respect for standards in relation to the system of reference. 3.5 Respect for the drawing conventions that apply to the process(es) involved. 3.6 Quality of the drawings produced.

CODE : 010E

4. To dimension and annotate the parts.

4.1 Respect for the conventions that apply to the procedures and assemblies.

4.2 Relevance and precision of the information pertaining to the dimensions of the parts.

4.3 Consistency of dimensions.

4.4 Relevance and precision of annotations.

5. To translate the elements selected into design criteria.

5.1 Accurate determination of the functions and performances expected from the product.

5.2 Precise and concise formulation of statements.

5.3 Proper levels of priority for the different criteria.

5.4 Appropriate organization of the design criteria.

CODE : 010F	
OBJECTIVE	STANDARD
Statement of the Competency To produce mock-ups. Elements of the Competency 1. To analyze the purposes of the mock-ups. 2. To determine the characteristics of the mock-up. 3. To plan the production of the mock-up. 4. To make the parts. 5. To finish the parts.	Achievement Context • For the development or validation of a concept. • Based on: - information provided by the project manager; - technical information; - instruments, tools and equipment; - materials and products; - technical drawing software and 3D modelling tools. Performance Criteria 1.1 With reference to the specifications book. 1.2 Accuracy in determining the requirements for the mock-up. 2.1 Consideration of the prescribed time frame and budget. 2.2 Appropriate type of mock-up and characteristics. 2.3 Appropriate choice of materials and work methods. 2.4 Demonstration of ingenuity. 3.1 Accuracy in translating the technical specifications of the workshop drawings. 3.2 Appropriate work programming. 3.3 Establishment of a realistic work schedule. 4.1 Appropriate set-up of the equipment, material and work area. 4.2 Respect for the workshop drawings. 4.3 Respect for occupational health and safety rules. 4.4 Correct use of tools and equipment. 4.5 Precision of the resulting parts. 5.1 Appropriate preparation of surfaces. 5.2 Respect for occupational health and safety rules. 5.3 Respect for the techniques used to apply the finishing products. 5.4 Quality of the finish.

CODE : 010F	
6. To assemble the parts.	6.1 Appropriate preparation of surfaces. 6.2 Observance of occupational health and safety rules. 6.3 Correct use of the techniques used to apply the finishing products. 6.4 Quality of the finish.
7. To do the final set-up.	7.1 Precise integration and adjustment of the components and the elements provided. 7.2 Consistency of the mock-up with the workshop drawings. 7.3 Quality of the set-up.
8. To check the mock-up.	8.1 Consistency of the mock-up with the initial requirements and the workshop drawings.

CODE : 010G	
OBJECTIVE	STANDARD
Statement of the Competency To undertake the technical development of a product. Elements of the Competency 1. To analyze the preliminary concept. 2. To integrate the conceptual and technical data. 3. To define the current manufacturing environment.	Achievement Context • Based on: - conceptual and technical data; - a specifications book; - a work schedule; - descriptions of parts, or actual parts. • Using: - documentation on technical aspects and standards; - technical drawing and 3D modeling software; - measuring instruments. Performance Criteria 1.1 Relevant interpretation of the project's conceptual data. 1.2 Intensive evaluation of the technical requirements and constraints. 1.3 Consideration of the economic factors affecting product development. 1.4 Evidence of rigour and critical thinking. 1.5 Consideration of the later steps in the design process. 2.1 Appropriate choice of environment and software tools. 2.2 Relevance and consistency of data coordination. 2.3 Detailed and precise listing of known parts. 2.4 Consideration of product usage and operation. 2.5 Functional use of representation tools. 3.1 Application of an appropriate information research method. 3.2 Intensive study of the manufacturer's production, assembly and finishing procedures. 3.3 Precise verification of the formal and dimensional characteristics. 3.4 Effective use of technical documentation.

CODE : 010G	
4. To study the architecture of the product.	4.1 With reference to the specifications book. 4.2 Effective use of modelling techniques. 4.3 Demonstration of creativity and ingenuity. 4.4 Practicality and feasibility of proposals. 4.5 Rigorous evaluation of the advantages and disadvantages of each proposal.
5. To define the structure of the product.	5.1 Appropriate choice of the architectural characteristics of the product. 5.2 Precise definition and description of the parts and components of the product. 5.3 Respect for the drawing conventions applicable to this procedure.
6. To finalize the presentation of the documents with a view to verification.	6.1 Consistent organization and presentation of documents. 6.2 Demonstration of openness to criticism. 6.3 Clear and explicit communication of technical information. 6.4 Effective collaboration in problem solving.

CODE : 010H	
OBJECTIVE	STANDARD
Statement of the Competency To use industrial manufacturing technologies. Elements of the Competency 1. To select the materials required for manufacturing a product. 2. To select a procedure to use in producing a product.	Achievement Context • During the conceptual and technical development of a product. • Based on: - a specifications book; - information about the manufacturer; - information provided by the project manager; - technical documentation. • Using: - graphic tools; - measuring instruments. • With the help of manufacturing specialists. Performance Criteria 1.1 Accurate analysis of the performance expected from the parts. 1.2 Relevant determination of the materials' technical specifications. 1.3 Effective use of research tools and sources of information. 1.4 Establishment of a list of materials likely to match the requirements and constraints imposed by the situation. 2.1 Detailed study of the preliminary design: product architecture and configuration of the parts. 2.2 Consideration of the number of parts to be produced. 2.3 Consideration of the manufacturing materials' characteristics. 2.4 Effective use of research tools and sources of information. 2.5 Selection of procedures likely to satisfy the technical requirements of the specifications book. 2.6 Methodical analysis of the applicable procedures: production operations and sequence. 2.7 Selection of the optimal procedure for conveying the configuration of the parts.

CODE : 010H	
3. To specify the manufacturing details of a product in reference to a material and a forming procedure.	3.1 Respect for the factors applicable to an efficient and cost-effective design. 3.2 Intensive study of the preliminary design: product architecture and configuration of the parts. 3.3 Logical and relevant adaptation of the configuration of the parts to the technical constraints and typical applications of the procedure. 3.4 Precise determination of the technical specifications of each part. 3.5 Determination of a logical and functional manufacturing sequence.
4. To plan the finish of a product.	4.1 With reference to the specifications book. 4.2 Consideration of the characteristics of the manufacturing materials. 4.3 Effective use of the research tools and sources of information. 4.4 Accuracy in determining the methods for finishing surfaces. 4.5 Appropriate choice of types of finish, products and finishing materials. 4.6 Accuracy in determining the sequence for finishing the parts. 4.7 Effective coordination of the assembling and finishing stages. 4.8 Concern for cost-effectiveness and efficiency.
5. To determine the product assembly strategy.	5.1 With reference to the specifications book. 5.2 Consideration of the configuration of the parts. 5.3 Effective use of the research tools and sources of information. 5.4 Accuracy in determining assembly methods in relation to the characteristics of the materials and the configuration of the parts. 5.5 Appropriate choice of assembly material and elements. 5.6 Accuracy in determining the assembly sequence. 5.7 Concern for cost-effectiveness and efficiency.

CODE : 010H	
6. To adapt the preliminary design of a product to a manufacturing environment.	6.1 Intensive analysis of the specifications booklet. 6.2 Consideration of the typical applications of the procedures. 6.3 Discovery of varied, original and significant forms and ideas. 6.4 Appropriate development and refinement of ideas and forms. 6.5 Critical evaluation of the potential of the ideas and forms discovered. 6.6 Use of the representation tools. 6.7 Consideration of the feasibility of the proposed design.

CODE : 010J	
OBJECTIVE	STANDARD
Statement of the Competency To advise a client on the formal and aesthetic dimensions of a product. Elements of the Competency 1. To analyze the project data. 2. To plan the work.	Achievement Context - Based on data pertaining to the development of the product. - Using: - advertising documents, specialized journals, etc.; - equipment and computer material. - With the help of those responsible for marketing the product. - Under the supervision of the project manager. Performance Criteria 1.1 Consideration of the company's marketing strategy. 1.2 Clear establishment of the client's expectations with regard to the product's characteristics. 1.3 Clarification of the degree of flexibility with regard to product development. 1.4 Realistic evaluation of the chances of achieving the expected results. 1.5 Respect for confidentiality of information. 2.1 Consideration of the prescribed time frame and budget. 2.2 Diversified, detailed research on: - the background of the product; - the target group; - market trends, etc. 2.3 Establishment of an appropriate work plan and schedule. 2.4 Concern for the efficiency and cost-effectiveness of the work.

CODE : 010J	
3. To analyze various products from a formal and aesthetic perspective.	3.1 Consideration of design principles. 3.2 Precise interpretation of the formal organization of the products. 3.3 Appropriate study of the products from a semantic perspective. 3.4 Critical and constructive evaluation of the formal and aesthetic characteristics of the products. 3.5 Appropriate representation of the formal structure.
4. To show how the formal and aesthetic dimensions of products are related to their fabrication, use and function.	4.1 Accurate recognition of the functional characteristics of the different parts of the product. 4.2 Relevant determination of the ways in which the parts of the product are interrelated. 4.3 Evaluation of the degree of harmonization of the functional and formal levels. 4.4 Evaluation of the degree to which the manufacturing procedures are capable of rendering the forms.
5. To work out a reference system for product development.	5.1 Evidence of openness to current and future stylistic tendencies. 5.2 Effective use of the results of previous analyses. 5.3 Use of drawing and modelling tools. 5.4 Matching of the selected development factors with the client's expectations. 5.5 Practicality and relevance of the design criteria.
6. To carry out conceptual and technical development.	6.1 Consideration of the design criteria. 6.2 Consistency in the organization of the various elements that make up the product. 6.3 Consideration of the potential for translating the concepts into concrete form. 6.4 Search for a balance between the product's aesthetic and formal requirements and its use, function and fabrication. 6.5 Appropriate rendering and modelling of the developed designs.

CODE : 010J	
7. To present the developed designs.	7.1 Relevant selection and structuring of information. 7.2 Demonstration of the advantages and disadvantages of the proposed designs. 7.3 Proposals for alternate solutions likely to satisfy expectations. 7.4 Evidence of attitudes and behaviours conducive to collaboration.

CODE : 010K	
OBJECTIVE	STANDARD
Statement of the Competency To study the relationship between the user and the product from an ergonomic perspective. Elements of the Competency 1. To study the specifications book. 2. To determine how the user actually uses the product.	Achievement Context - Based on: - a product with a user interface; - a specifications book. - Using: - documentation on technical aspects and standards; - computer equipment and software; - measuring instruments. - Through contact with product users. Performance Criteria 1.1 Adequate selection of criteria associated with: - the use of the product; - ergonomics; - safety standards; - anthropometric standards. 1.2 Rigorous study of user-related data. 1.3 Consideration of expected performance levels, from the perspective of actual use. 2.1 Demonstration of professionalism in making observations. 2.2 Comprehensive listing of the activities or operations carried out with the product. 2.3 Detailed description of handling or movements involving maximum amplitude. 2.4 Accuracy in determining the parts of the body or the senses called into play. 2.5 Precise recognition of the physical conditions integral to the use environment. 2.6 Accuracy in determining the effects of the physical conditions on the user.

CODE : 010K	
3. To determine the measurements and data that make it possible to satisfy a given target group.	3.1 Precise location of range of motion zones. 3.2 Adequate selection of measurements representing the boundaries of the target group. 3.3 Application of the correction factors that apply to the measurements in question. 3.4 Effective use of technical documentation. 3.5 Graphics appropriate for the target group.
4. To determine the uses of the product.	4.1 Precise determination of the product components handled by the user. 4.2 Precise location of indications or messages explaining what happens when the components are used. 4.3 Precise determination of the components that provide information on the functioning of the product or the result of an action. 4.4 Precise measurement of the dimensions and position of the components.
5. To evaluate how the product is used by a target group.	5.1 Consideration of the characteristics of the target group and the product-use scenarios. 5.2 Consideration of the standards that apply. 5.3 Appropriate analysis of the arrangement and positioning of the components. 5.4 Establishment of relevant links between the characteristics of the product and the surrounding environment. 5.5 Correct evaluation of the strengths and weaknesses of the product when in use.

CODE : 010K	
6. To refine the tests to be used for verifying ergonomic performance.	6.1 Consideration of the target group and situations where the product is used in a given context. 6.2 Consideration of the applicable standards or requirements. 6.3 Precise determination of the activities or operations to be tested. 6.4 Appropriate choice of the types of measures to be carried out. 6.5 Adequate choice of control group. 6.6 Appropriate determination of the testing sequence and conditions. 6.7 Correct determination of the characteristics of the mock-up or model to be manufactured.

CODE : 010L	
OBJECTIVE	STANDARD
Statement of the Competency To enhance a product's use potential. Elements of the Competency 1. To analyze the project data. 2. To plan the work. 3. To analyze the use of different products.	Achievement Context • Based on information provided by the project manager. • Using: - technical documentation; - computer equipment and software. • With the collaboration of resource people from a specific sector of the market. • Through contact with users of the product. Performance Criteria 1.1 Consideration of the company's planned marketing strategy. 1.2 Critical analysis of the design directions provided. 1.3 Realistic evaluation of the chances of achieving the expected results. 1.4 Respect for confidentiality of information. 2.1 Consideration of the prescribed budget and time frame. 2.2 Varied, detailed research on: - ways of using and maintaining the various products available on the market; - prescribed standards and safety. 2.3 Establishment of an appropriate work plan and schedule. 2.4 Concern for the efficiency and cost-effectiveness of the work. 3.1 Consideration of the product's life cycle: fabrication, assembly, installation, use, etc. 3.2 Complete listing of all activities, operations, interventions or handling associated with the product. 3.3 Consideration of safety standards. 3.4 Critical evaluation of the products' practical functions in terms of innovation, strengths, weaknesses, etc.

CODE : 010L	
4. To gather data from users.	4.1 Consideration of safety standards. 4.2 Accuracy in planning ways of gathering information from users. 4.3 Refinement of appropriate data-gathering tools. 4.4 Evidence of professionalism. 4.5 Appropriate processing of data and observations. 4.6 Analysis of the relevance and effectiveness of the product's use.
5. To define a reference system for product development.	5.1 Relevant coordination of the practical functions to be improved, added or eliminated. 5.2 Consideration of the measurements and data pertaining to the target group and potential use scenarios. 5.3 Proper determination of the requirements that the product must satisfy at the functional, technical and formal levels. 5.4 Relevant choice of factors to be considered for development, given the company objectives. 5.5 Practicality and relevance of the stated design criteria. 5.6 Use of graphic tools.
6. To carry out conceptual and technical development.	6.1 Effective and functional use of design software. 6.2 Consideration of the reference system that was defined. 6.3 Delineation of development ideas in light of the technical data. 6.4 Creative and thorough exploration of work avenues. 6.5 Smooth and consistent integration of the product's functions and elements.
7. To evaluate the solutions that have been worked out.	7.1 Refinement of relevant evaluation tools. 7.2 Accuracy in comparing solutions with the reference system that was devised. 7.3 Classification of solutions in order of priority.

CODE : 010L	
8. To present the solutions.	8.1 Relevant selection and structuring of the information, given the company's objectives. 8.2 Convincing demonstration of the impact of product quality on the proposed operating plan. 8.3 Demonstration of openness to criticism. 8.4 Relevant alternate solutions suggested.

CODE : 010M	
OBJECTIVE	STANDARD
Statement of the Competency To analyze the structure of an object. Elements of the Competency 1. To study the specifications book. 2. To describe the geometry of the object. 3. To determine the stress to be placed on on the object. 4. To evaluate the effects of the stresses exerted on the object.	Achievement Context • During the technical development of a product. • Based on: - documentation on technical aspects and standards; - specifications book. • Using: - measuring instruments; - drawing materials and equipment. Performance Criteria 1.1 Selection of appropriate criteria with reference to the physical characteristics of the object. 1.2 Consideration of the expected performance levels. 2.1 Accuracy in determining the structural elements of the object. 2.2 Precise location of critical points and linkages. 2.3 Precision of the dimensions of the element section and critical distances. 2.4 Appropriate illustration of the geometry of the object. 3.1 Complete listing of the activities carried out with the object in typical and extreme operating conditions. 3.2 Accurate translation of the activities to suit the stress placed on the object. 3.3 Consideration of applicable safety standards and factors. 3.4 Appropriate illustration of the forces brought to bear on the object. 4.1 Precise mapping of the distribution of stresses over the structure of the object. 4.2 Precise determination of the components or assemblies subject to the greatest degree of stress. 4.3 Correct evaluation of effects, including the risks of deforming or shifting the object.

CODE : 010M	
5. To develop tests that can be used to verify the structural performance of the object.	5.1 Consideration of the actions performed with the object, and of the applicable standards and requirements. 5.2 Accurate determination of the components or assemblies to be tested. 5.3 Appropriate choice of types of measurements to be carried out. 5.4 Appropriate determination of the test sequence and conditions. 5.5 Correct determination of the characteristics of the mock-up or model to be made.

CODE : 010N	
OBJECTIVE	STANDARD
Statement of the Competency To improve the ways in which a product functions. Elements of the Competency 1. To analyze the product data. 2. To plan the work.	Achievement Context • Based on: - information provided by the project manager; - technical specifications provided by the company; - descriptions of components, or actual components. • Using: - technical documentation; - computer equipment and software; - measuring instruments; - tools and materials used for disassembling products. Performance Criteria 1.1 Consideration of the company's projected marketing strategy. 1.2 Intensive study of the technical data. 1.3 Critical analysis of the design directions provided by the company. 1.4 Realistic evaluation of the chances of achieving the desired results. 1.5 Respect for confidentiality of information. 2.1 Consideration of the prescribed time frame and budget. 2.2 Varied, detailed research on: - components and technologies; - functioning and technical characteristics of the different products available on the market; 2.3 Development of an appropriate work plan and schedule. 2.4 Concern for the efficiency and cost-effectiveness of the work.

CODE : 010N	
3. To analyze the intrinsic functioning of various product families.	3.1 Precise location of the parts and components involved in the operation of the product. 3.2 Precise recording of element dimensions. 3.3 Intensive study of the types of links or relations between the elements. 3.4 Accurate recognition of the operating principles and technologies applied to the products. 3.5 Appropriate diagram of the functional organization of the products. 3.6 Critical evaluation of the products' functioning: strengths, weaknesses, innovations, etc.
4. To analyze the ways in which the product functions in relation to the services it provides.	4.1 Complete description of the services provided by the product. 4.2 Precise determination of the role of the product's functional elements. 4.3 Appreciation of the extent of the product's effectiveness in providing the services.
5. To define a reference system for product development.	5.1 Pertinent linking of the potential for: – modifying the services rendered; – integrating new components; – applying technologies; – organizing elements. 5.2 Accuracy in determining the formal, technical and usage requirements that the product will have to satisfy. 5.3 Adequate study of the safety standards and technical specifications. 5.4 Relevant choice of factors to be considered for development, given the company's objectives. 5.5 Practicality and relevance of the stated design criteria. 5.6 Demonstration of openness to current trends. 5.7 Use of drawing tools.

CODE : 010N	
6. To carry out conceptual and technical development.	6.1 Effective and functional use of design software. 6.2 Consideration of the reference system that was devised. 6.3 Delineation of relevant development ideas in light of the technical data. 6.4 Creative and detailed exploration of work avenues. 6.5 Consistent integration of technical data into the product's operations.
7. To evaluate the solutions that have been defined.	7.1 Refinement of relevant evaluation tools. 7.2 Accuracy in comparing solutions to the reference system that was devised. 7.3 Classification of solutions in order of priority.
8. To present the solutions.	8.1 Relevant selection and structuring of information, given the company's objectives. 8.2 Convincing demonstration of the qualities of the proposed product on the operating plan. 8.3 Demonstration of openness to criticism. 8.4 Relevant alternate solutions presented.

CODE : 010P	
OBJECTIVE	STANDARD
Statement of the Competency To offer professional services. Elements of the Competency 1. To develop promotional documents. 2. To look for potential clients. 3. To define a work mandate.	Achievement Context - Using reference documents. - Based on personal experiences and achievements. - Using data processing, photographic and copying equipment and material, etc. Performance Criteria 1.1 Realistic determination of the professional services to be offered and the areas of intervention in industrial design. 1.2 Appropriate choice of promotional tools in relation to the types of service to be promoted and the target groups. 1.3 Quality in the presentation and content of documents. 2.1 Search for contracts or work compatible with his/her competencies. 2.2 Use of relevant and varied sources of information. 2.3 Use of resource and contact networks. 2.4 Behaviour adapted to the people and situations encountered. 2.5 Demonstration of positive behaviour. 3.1 Respect for the code of professional ethics. 3.2 Active listening to the company representative. 3.3 Consideration of the company objectives. 3.4 Relevance of the questions posed to clarify the service to be rendered or the product to be designed. 3.5 Clarification of his/her role and professional responsibilities. 3.6 Effective search for compromises when setting the terms of the agreement.

CODE : 010P

4. To draft an offer of service.

- 4.1 Consideration of the design process.
- 4.2 Appropriate choice of methodology and work activities.
- 4.3 Establishment of a detailed work schedule.
- 4.4 Precise calculations of the costs for the services offered, including professional fees and related expenses.
- 4.5 Appropriate organization and preparation of documents.
- 4.6 Respect for the code of professional ethics.

CODE : 010Q	
OBJECTIVE	STANDARD
Statement of the Competency To ensure that a product is technically feasible. Elements of the Competency 1. To analyze the product's technical data. 2. To plan the work.	Achievement Context • Based on: - information provided by the project manager; - technical specifications furnished by the company; - descriptions of components, or actual components. • Using: - technical documentation; - computer equipment and software; - measuring instruments; - tools and material for disassembling a product; • With the help of manufacturing specialists. Performance Criteria 1.1 Consideration of the company's projected manufacturing strategy and costs. 1.2 In-depth study of the product's technical requirements. 1.3 Critical analysis of the work avenues provided. 1.4 Recognition of the factors that have a determining influence on project development. 1.5 Realistic evaluation of the chances of achieving the desired results. 1.6 Respect for confidentiality of information. 2.1 Consideration of the prescribed time frame and budget. 2.2 Varied, detailed research on the manufacturing materials and procedures. 2.3 Establishment of an appropriate work program and schedule. 2.4 Concern for the efficiency and cost-effectiveness of the work.

CODE : 010Q	
3. To study the production environment of the client's company.	3.1 Accurate association of the manufacturing sequence with the manufacturing procedures and equipment used. 3.2 Accurate recognition of the human resources and materials necessary for the manufacturing process. 3.3 Recognition of the manufacturing operations carried out by the company or handed over to sub-contractors. 3.4 Accurate appreciation of the company's potential manufacturing capacity.
4. To analyze the structure of the product.	4.1 Intensive study of the product's structure, parts and components. 4.2 Accurate recognition of the nature and function of the links and relationships between the elements. 4.3 Accurate recognition of the role of the parts in the product's purpose, operations and aesthetics. 4.4 Clear and explicit diagram of the structure of the product. 4.5 Correct appreciation of the strengths and weaknesses in the structural organization of the product.
5. To analyze the manufacturing of the product.	5.1 Correct appreciation of the manufacturing procedures, given the shapes of the parts. 5.2 Establishment of relevant links between the manufacturing materials and their characteristics. 5.3 Accurate recognition of the techniques used in assembling and finishing the parts. 5.4 Precise recording of the configuration and dimensions of the parts. 5.5 Analysis of the suitability of the means used and the characteristics of the manufactured product.

CODE : 010Q	
6. To work out a reference system for product development.	6.1 Meaningful linking of the company's production capacity, the means it employs and the characteristics of the product. 6.2 Adequate determination of the design requirements that the product will have to satisfy. 6.3 Proper study of the potential for the transfer of technology. 6.4 Relevance of the choice of factors to be considered for development, given the company's objectives. 6.5 Practicality and relevance of the stated design criteria.
7. To carry out technical development.	7.1 Effective and functional use of technical-drawing and 3D-modelling software. 7.2 Consideration of the reference system that was devised. 7.3 Relevance of suggestions with respect to the types of materials that could be used. 7.4 Use of manufacturing procedures already employed by the company. 7.5 Consistency and relevance in the organization of the elements and integration of the components. 7.6 Precise determination of the configuration and dimensions of the parts in relation to procedures. 7.7 Precise determination of the manufacturing strategy.
8. To develop documents for the purpose of presenting proposals.	8.1 Selection of information relevant to the company objectives. 8.2 Use of data processing tools. 8.3 Convincing illustration of the technical feasibility of the proposals. 8.4 Quality of the technical documentation.

CODE : 010R	
OBJECTIVE	STANDARD
Statement of the Competency To advise the client with respect to the economic aspects of a product. Elements of the Competency 1. To analyze the project data. 2. To plan the work. 3. To analyze the company product from an economic perspective.	Achievement Context - Based on data provided by the company. - Using technical documentation and reference books. - Through contact with manufacturers, distributors and suppliers. - Using computer equipment and software. - Under the supervision of the project manager. Performance Criteria 1.1 Consideration of the company's marketing strategy. 1.2 Rigorous study of the company's manufacturing environment. 1.3 Accuracy in correlating the quantities to be produced with the anticipated cost price. 1.4 Clarification of the degree of flexibility required for product development. 1.5 Realistic evaluation of the chances of achieving the desired results. 2.1 Consideration of the prescribed time frame and budget. 2.2 Varied, detailed research on the factors that determine the price of the product. 2.3 Establishment of appropriate design directions and schedule. 2.4 Concern for efficiency and cost-effectiveness. 3.1 Detailed study of the product design. 3.2 Accurate recognition of the materials used: types, quantities, costs. 3.3 Detailed study of primary and secondary forming, assembling and finishing operations. 3.4 Proper study of the requirements associated with the distribution of the product. 3.5 Consideration of the functional, technical and formal characteristics. 3.6 Accurate analysis of the company's use of resources.

CODE : 010R	
4. To define a reference system for the development of the product.	4.1 Determination of the factors that should make it possible to set the cost price of the product. 4.2 Relevant choice of factors to be considered for development, given the company objectives. 4.3 Practicality and relevance of the stated design criteria.
5. To define manufacturing strategies.	5.1 Consideration of the reference system that was devised. 5.2 Application of the design principles toward cost-effective production. 5.3 Use of data processing tools. 5.4 Establishment of strategies that foster efficiency and cost-effectiveness in production. 5.5 Correct estimation of the costs of each strategy. 5.6 Correct appreciation of strategies, given the anticipated costs and expenses.
6. To present the strategies.	6.1 Selection of information relevant to the company objectives. 6.2 Convincing demonstration of the characteristics of the proposed strategies. 6.3 Demonstration of a spirit of cooperation. 6.4 Alternative solutions likely to meet expectations.

CODE : 010S	
OBJECTIVE	STANDARD
Statement of the Competency To produce technical documentation for the production phase. Elements of the Competency 1. To define the work program. 2. To make production drawings. 3. To draft the technical specifications.	Achievement Context • Based on: - technical specifications pertaining to the product; - files or preliminary technical drawings; - a work schedule. • Using: - documentation on technical information and standards. - technical drawing and modelling software. • With the collaboration of manufacturing specialists. • Under the supervision of the project manager. Performance Criteria 1.1 Consideration of the project schedule. 1.2 Establishment of a practical and methodical work strategy. 1.3 Consideration of the rules governing the organization and presentation of documents. 1.4 Astute choice of people likely to provide information. 1.5 Correct evaluation of work time. 2.1 Astute choice of assembly views. 2.2 Use of modelling software. 2.3 Presentation of all the required detail drawings. 2.4 Precision of the dimensions and annotations on each part. 2.5 Respect for the rules governing layout and presentation. 2.6 Astute choice of printing or file formats. 3.1 Precise specifications for the materials, forming procedures and finishing. 3.2 Detailed list of the components and hardware to be incorporated into the product. 3.3 Relevance of indications pertaining to the assembly methods and sequence.

CODE : 010S	
4. To estimate the manufacturing costs.	4.1 Quality of communication with the suppliers and sub-contractors. 4.2 Appropriate use of reference documents. 4.3 Realistic estimate of the cost of the product.
5. To finalize the documentation required for the production phase.	5.1 Appropriate organization and preparation of technical documents. 5.2 Appropriate choice of manufacturers likely to satisfy the project requirements. 5.3 Information selected for transmission relevant, given the profiles of the bidders. 5.4 Drafting of documents in compliance with the rules governing invitations to tender. 5.5 Respect for the code of professional ethics.

CODE : 010T	
OBJECTIVE	STANDARD
Statement of the Competency To carry out technical and functional validation. Elements of the Competency 1. To plan the work of validation. 2. To design the test model. 3. To make the test model.	Achievement Context • During a design project. • Based on: - a specifications book; - technical specifications sheet. • Using: - documentation on technical aspects and standards; - measuring instruments; - equipment, tools and products used to make models. • With the collaboration of various people. • Under the supervision of the project manager. Performance Criteria 1.1 Intensive study of the specifications book and sheet. 1.2 Accurate recognition of technical, functional and normative constraints. 1.3 Relevant determination: - of the tests to be carried out; - of the types of measurements and degree of precision required. 1.4 Consideration of the work budget and schedule. 1.5 Methodical and functional planning of work. 2.1 Appropriate choice of technical specifications for the model. 2.2 Appropriate choice of manufacturing techniques and materials for the model. 2.3 Consideration of the standards that apply to the product. 2.4 Precision of the workshop drawings. 2.5 Demonstration of resourcefulness and ingenuity. 3.1 Respect for the occupational health and safety rules. 3.2 Respect for working methods. 3.3 Adequacy of the model and workshop drawings. 3.4 Demonstration of rigour and precision in the work.

CODE : 010T	
4. To carry out tests designed to evaluate the technical characteristics of the model.	4.1 Accuracy in determining the test methods. 4.2 Rigorous study of model's mechanical, physical and chemical performance. 4.3 Accuracy of measurements and relevance of observations.
5. To carry out tests designed to evaluate the functional characteristics of the model.	5.1 Accuracy in determining trial methods. 5.2 Clarity of the instructions transmitted to the users. 5.3 Rigorous study of user-product relationship. 5.4 Accuracy in interpreting user comments. 5.5 Precision of annotations and relevance of observations.
6. To analyze the results of the tests.	6.1 Appropriate structuring and processing of results. 6.2 Relevance of the interpretation of the quantitative and qualitative data. 6.3 Precise recording of the strengths and weaknesses of the model. 6.4 Accuracy in determining the modifications to be made to the product. 6.5 Quality of communication with the members of the work team.
7. To update the technical specifications.	7.1 Effective collaboration in solving the problems encountered. 7.2 Practicality and feasibility of the proposed solutions. 7.3 Precision of the modifications to the technical specifications. 7.4 Consistency in the organization and presentation of corrections.

EDUCATIONAL INTENTIONS OF GENERAL EDUCATION

GENERAL EDUCATION COMMON TO ALL PROGRAMS AND GENERAL EDUCATION ADAPTED TO PROGRAMS

English, Language of Instruction and Literature

General Education Common to All Programs

The three sets of objectives and standards in English, Language of Instruction and Literature, 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. Building on the skills developed by students on completion of secondary school, the English programme places a marked emphasis on written production and reading comprehension while at the same time consolidating listening and speaking skills.

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 reading and the 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 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.

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 provide a range of reading, writing and literary activities, one includes additional reinforcement of reading and writing skills.

General Education Adapted to Programs

The set of objectives and standards for English, Language of Instruction and Literature, 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 their field of study.

Outcome Objectives

Students who have achieved the general education objectives in English, Language of Instruction and Literature, will be able to :

- Demonstrate a college level of proficiency in the areas of reading, writing, listening and speaking.
- Develop their own ideas into arguments and theses, organize them and edit their work.
- Understand basic vocabulary and terminology used when discussing literature.
- Analyze literary works.

Humanities

Humanities, as part of the core curriculum, 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 labour 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

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

Outcome Objectives

Students who have achieved the general education objectives in Humanities will be able to :

- Describe, explain and organize 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.
- 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.

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 first set, the emphasis 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. Students learn to situate knowledge in a social, historical and personal context, a skill they will need in order to become lifelong learners.

The second set focuses 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 adapted to programs 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 world view 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

L'enseignement du français, langue seconde, contribue à la formation fondamentale de la personne, en même temps qu'il a pour objet de lui permettre de communiquer efficacement avec ses concitoyens et concitoyennes.

Principes

- 1) La maîtrise du français, langue seconde, est essentielle pour quiconque veut participer pleinement à la vie de la société québécoise, dont le français est la langue officielle. En conséquence, la formation générale en français, langue seconde, a pour finalité de rendre les étudiants et les étudiantes aptes à utiliser de façon efficace les moyens dont dispose la langue pour communiquer en société. À cette fin, ils devront acquérir des connaissances en vue de les déployer dans les formes de discours qu'il leur faudra pratiquer.
- 1) À leur arrivée au collégial, les étudiants et les étudiantes ont déjà acquis des compétences dans les quatre habiletés langagières, à savoir : parler, lire, écouter et écrire, mais sont, de façon générale, plus compétents en matière d'expression orale. En conséquence, la formation porte sur le développement des quatre habiletés langagières tout en mettant l'accent sur la lecture et l'écriture.
- 2) En tant que partie intégrante de la formation générale, le français, langue seconde, contribue au développement de la pensée critique et de l'expression structurée.

Résultats attendus

Tout étudiant ou toute étudiante qui a atteint les objectifs de formation générale en français, langue seconde, pourra, selon son niveau de compétence, montrer :

- sur le plan des connaissances, qu'il ou elle :
 - sait faire une présentation orale structurée;
 - connaît les différentes formes du discours;
 - connaît les différentes techniques de lecture et d'écriture;
- sur le plan des habiletés, qu'il ou elle :
 - est capable de questionner, d'analyser, de juger, et d'argumenter en français;
 - est apte à entretenir des rapports sociaux et à partager la vie culturelle du Québec;
 - est apte à établir, à poursuivre et à pratiquer des rapports professionnels en français;
- sur le plan des attitudes, qu'il ou elle :
 - fait preuve d'ouverture par rapport aux différents aspects de la culture québécoise;
 - a conscience des différences et des similitudes entre sa culture d'origine et la culture québécoise francophone;
 - a la préparation voulue pour s'insérer dans la vie sociale et économique.

Séquence des objectifs et des standards

Pour répondre aux divers besoins d'apprentissage des étudiants et des étudiantes du collégial, les ensembles en français, langue seconde, sont répartis selon quatre niveaux. Chacun de ces niveaux permet d'amener les étudiants et les étudiantes à interpréter et à produire des textes de plus ou moins grande complexité.

La formation générale en français, langue seconde, comporte deux ensembles prévus en séquence. Le premier, qui fait partie de la formation générale commune à tous les programmes, a pour objet de consolider les connaissances linguistiques déjà acquises et de les développer pour amener les étudiants et les étudiantes à communiquer de façon plus précise sur le plan tant du vocabulaire et de la syntaxe que de l'organisation textuelle.

Le second ensemble, qui fait partie de la formation générale propre aux programmes, s'appuie sur les acquis développés dans le premier ensemble en les enrichissant d'éléments de compétence liés aux champs d'études de l'étudiant ou de l'étudiante. On cherche à développer la précision de l'expression dans des situations de communication particulières qui relèvent du champ d'études de l'étudiant ou de l'étudiante.

Physical Education

Physical Education, as part of the core curriculum, is aimed at promoting the development of the whole person and at encouraging students to acquire responsible behaviours with respect to their health and quality of life.

Principles

- 1) Physical Education introduces students to different ways of being physically active with a view to making them aware that they are responsible for their health. Students learn concepts and acquire knowledge drawn from the literature and methodically apply them to physical activities apt to lead them to adopt behaviours characteristic of a healthy lifestyle.
- 2) Physical Education enables students to improve their proficiency in an activity and, in doing so, serves to increase their motivation and perseverance to remain physically active, and makes them aware of the contributing factors. To this end, students use a learning process designed to enhance their aptitudes for a given physical activity (i.e., their skills and attitudes).
- 3) Physical Education contributes to making students responsible for assuming responsibility for their health through the maintenance and improvement of their physical fitness and through the sensible practice of physical activity. Students learn to combine being physically active in an effective manner with factors which promote health.
- 4) Physical Education makes students aware of the importance of sharing the knowledge they have acquired. The pleasure and sense of well-being students get out of Physical Education classes motivate them to encourage others to be physically active and to adopt healthy behaviours.

Outcome Objectives

Students who have achieved the general education objectives in Physical Education will be able to demonstrate :

- their knowledge of :
 - The relationship between physical activity, lifestyle and health based on the findings of scientific research.
 - The scientific principles for improving or maintaining one's fitness.
 - Ways to assess their abilities and needs with respect to activities which can enhance their health.
 - The rules, techniques and conditions involved in different types of physical activity.
 - A method for setting goals.
 - The factors which facilitate making physical activity part of one's lifestyle.
- their ability to :
 - Choose physical activities on the basis of their motivation, abilities and needs.
 - Establish relationships between lifestyle and health.

- Apply the rules, techniques and conditions involved in different types of physical activity.
 - Set goals that are realistic, measurable, challenging, and situated within a specific time frame.
 - Improve their mastery of the basic techniques, tactics and strategies associated with sports, outdoor and expression-oriented activities.
 - Use their creative and communication skills, particularly in group activities.
 - Evaluate their skills, their attitudes and their progress with respect to different forms of physical activity.
 - Maintain or increase their physical activity level and fitness level on their own.
 - Manage a personal physical activity program and assume responsibility in the organization of physical activities.
- their capacity to (i.e., their attitudes):
- Recognize the importance of taking charge of their health.
 - Be aware of the need to evaluate and respect their abilities and how the activity is to be carried out, before initiating the activity.
 - Foster self-confidence, self-control, respect for others and cooperation, through the knowledge they have acquired and through participation in physical activity.
 - Respect the environment in which the activities are held.
 - Appreciate the aesthetic and play value of physical activity.
 - Promote a balanced and active lifestyle as a social value.

Sequence of Objectives and Standards

The three sets of objectives and standards in Physical Education are designed in a learning sequence. The first two are prerequisites for the third.

The first set focuses on the relationship between good health and physical activity as related to a healthy lifestyle. Students are required to try one or more activities and to relate them to their abilities, needs, motivation, lifestyle and knowledge of health promotion. This enables them to make an appropriate and justified choice of physical activities.

The second set looks at the improvement of effectiveness through the use of a goal-oriented approach in a sport, outdoor or expression-oriented activity. After an initial assessment, students are called upon to evaluate their abilities and attitudes with respect to a physical activity, to set goals, and to interpret their progress.

The third set is aimed at bringing students to integrate physical activity into their lifestyle, more particularly through more effective management of factors which facilitate such an integration. During contact-hours with the teacher, students apply the knowledge they have acquired in the first two sets. This is done through the safe and effective practice of physical activity and through the development, realization and evaluation of a personal physical activity program, which students follow and validate under their teacher's supervision. The hours allotted for personal work enable students to complete their personal program.

Éducation

Québec 

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