Biomedical Laboratory Technology (140.C0)

Sector 19 – Health Services

College Education Program

Québec

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Table of Contents

140.C0 Biomedical Laboratory Technology

Year of approval: 2016

Type of certification:		Diploma of College Studies
Number of credits:		91 2/3 credits
Number of periods of instruction:	2 850	periods of instruction

General education component:	660	periods of instruction
Program-specific component:	2 190	periods of instruction

Maximum duration allotted to clinical training:	735	periods of instruction

Admission Requirements:

To be admitted to the program, a person must meet the general requirements for admission set out in the *College Education Regulations*, as well as the following special requirements, where applicable:

- Mathematics:
  Secondary IV, Technical and Scientific option
  Or
  Secondary IV, Science option
  Or
  Secondary V, Cultural, Social and Technical option
- Secondary V Physics
- Secondary V Chemistry

College-Level Programs

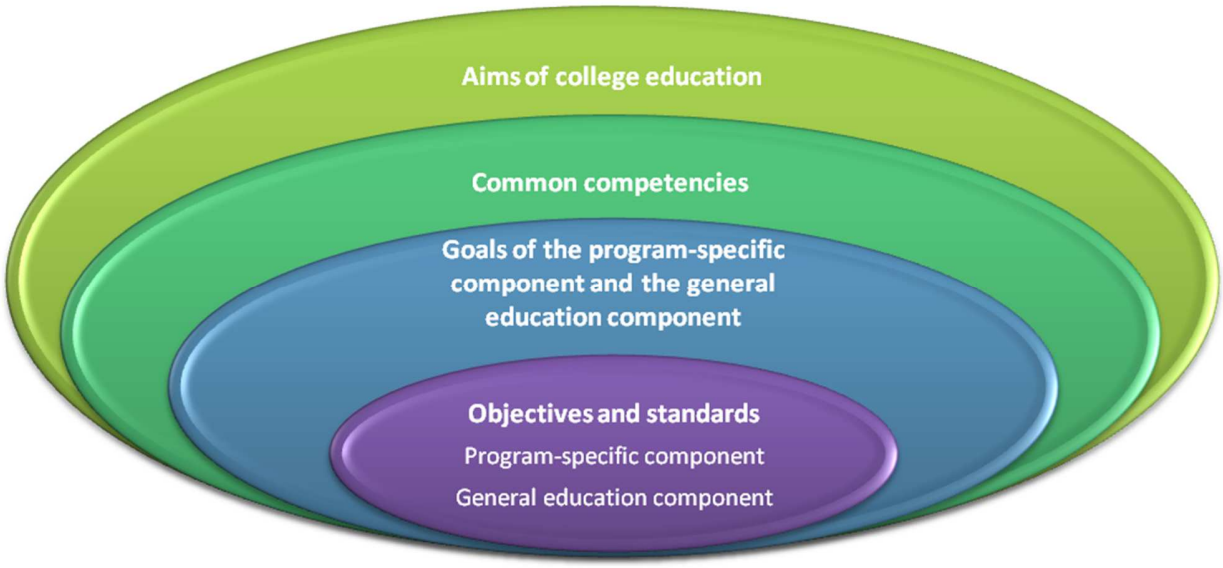
In Québec, college is the next stage after the compulsory years of schooling (elementary and secondary school). College graduates enter the labour market directly or proceed to university studies. The Minister of Education, Recreation and Sports establishes the programs of study, while individual colleges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

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

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

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

Figure 1 – Elements of a College-Level Program



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

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

Aims of College Education

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

To educate students to live responsibly in society

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

To help students integrate cultural knowledge into their studies

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

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

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

Common Competencies of College Education

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

Solve problems

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

Use creativity

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

Adapt to new situations

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

Exercise a sense of responsibility

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

Communicate

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

Implementation of College-Level Programs

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

The *Biomedical Laboratory Technology* Program

The *Biomedical Laboratory Technology* program was designed in accordance with the framework for developing technical programs. This approach involves the participation of partners working in the occupational field and in education, and takes into account training needs, the job analysis and the general goals of technical education. The objectives and standards serve as the basis for the definition and evaluation of learning activities, for which the colleges are responsible. By successfully completing this program of study, students acquire not only the entry-level competencies required by the workplace to practise the occupation, but also a range of knowledge, skills and attitudes that will ensure their versatility.

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

- The program-specific component consists of 65 credits.
- The general education component that is common to all programs consists of 16⅔ credits:
  - Language of Instruction and Literature: 7⅓ credits
  - Philosophy or Humanities: 4⅓ credits
  - Physical Education: 3 credits
  - Second Language: 2 credits
- The general education component that is specific to the program consists of 6 credits:
  - Language of Instruction and Literature: 2 credits
  - Philosophy or Humanities: 2 credits
  - Second Language: 2 credits
- The complementary general education component, which aims to expose students to subject areas outside their program of study, consists of 4 credits and includes courses in the following areas:
  - Social Sciences
  - Science and Technology
  - Modern Language
  - Mathematics Literacy and Computer Science
  - Art and Aesthetics
  - Contemporary Issues

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

Goals of the Program

Program-Specific Component

The goals of the program-specific component of the *Biomedical Laboratory Technology* program are based on the general goals of vocational and technical training. These goals are:

- To help students develop effectiveness in the practice of a trade or occupation, that is:
  - to teach students to perform roles, functions, tasks and activities associated with the trade or occupation upon entry into the job market
  - to prepare students to progress satisfactorily on the job (which implies having the necessary technical and technological knowledge and skills in such areas as communication, problem solving, decision making, ethics, health and safety)

- To help students integrate into the work force, that is:
  - to familiarize students with the job market in general and the context surrounding the occupation they have chosen
  - to familiarize students with their rights and responsibilities as workers

- To foster students' personal development and acquisition of occupational knowledge, skills, perceptions and attitudes, that is:
  - to help students develop their autonomy and the desire to learn, and acquire effective work methods
  - to help students understand the principles underlying the techniques and the technology used in the trade or occupation
  - to help students develop self-expression, creativity, initiative and entrepreneurial spirit
  - to help students adopt the attitudes required to successfully practise the trade or occupation, and instill in them a sense of responsibility and a concern for excellence

- To promote job mobility, that is:
  - to help students develop positive attitudes toward change
  - to help students develop the means to manage their careers by familiarizing them with entrepreneurship

Educational Aims

Educational aims in the program-specific component are based on important values and concerns and serve as guidelines for interactions with students. As a general rule, educational aims focus on important aspects of the students' professional and personal development, such as attitudes, work habits and intellectual skills, which have not been explicitly formulated in the program's goals, objectives and standards.

In keeping with the aims of college education, the program-specific component is also intended to educate students to live responsibly in society, to help them integrate cultural knowledge into their studies and, lastly, to help them master language as a tool for thought, communication and openness to the world.

The following is a description of the aims of the program-specific component of the *Biomedical Laboratory Technology* program:

- develop autonomy
- develop the ability to exercise good judgment
- develop the drive to keep up to date with current knowledge
- develop the ability to adapt to technoscientific and organizational changes

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

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

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

English, Language of Instruction and Literature

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

- will be able to demonstrate their knowledge of the following:
  - the basic vocabulary and terminology used when discussing literary works
  - ways to apply an independent analytical approach to literary genres
  - ways to apply an independent analytical approach to literary themes
  - the appreciation of literary and non-literary works or other artistic expressions of different historical periods and movements
  - ways to identify the socio-cultural and historical context of different periods and movements
  - ways to refine oral and written communication in the language of instruction

- will be able to demonstrate their ability to do the following:
  - read, write, listen and speak at a college level of proficiency
  - develop their own ideas in arguments and theses
  - organize their arguments and theses in a discourse and edit their work
  - produce and analyze various styles of discourse
  - communicate in the styles of discourse appropriate to one or more fields of study
- will be encouraged to develop the following attitudes:
  - independence, individuality, and open-mindedness in thought and action
  - an appreciation of literature and other artistic works from different periods
  - a recognition of the role of media within a society and its culture
  - an awareness of strategies that foster self-reflective practice in their learning and actions
  - critical and ethical thought

Humanities

Students who have achieved the general education objectives in humanities

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

French as a Second Language

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

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

Physical Education

Students who have achieved the general education objectives in physical education

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

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

Complementary General Education Component

Social Sciences

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

Science and Technology

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

Modern Language

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

Mathematics Literacy and Computer Science

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

Art and Aesthetics

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

Contemporary Issues

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

Goals of the Program-Specific Component

The *Biomedical Laboratory Technology* program prepares students to practise the professions of medical technologist and medical laboratory technician.

As professionals in the medical biology field, these technologists and technicians contribute to the diagnosis and therapeutic follow-up of clients. They thus also contribute to preventing illness and to maintaining and improving the health of the general population.

In accordance with the *Professional Code*, the scope of practice of medical technologists consists of performing medical biology analyses and examinations of the human body or specimens and ensuring the technical validity of results to be used for diagnosis or therapeutic follow-up.

Medical technologists and medical laboratory technicians work mainly in public health institutions. In clinical settings, these technologists and technicians are found in sample collection centres, outpatient and screening clinics, diagnostic laboratories, health care units and emergency departments. Medical technologists may also make house calls to take samples or perform analyses outside the laboratory. In the private sector, they may be employed by medical technology businesses such as biomedical laboratories, research centres and pharmaceutical companies.

Their work consists primarily of:

- taking biological samples, based on a requisition (activity reserved for medical technologists)
- preparing body fluid samples, according to a requisition
- preparing body tissues and histological sections, according to a requisition
- performing routine biomedical analyses and specialized prescribed analyses in the fields of hemostasis, hematology, biochemistry, microbiology, transfusion medicine and molecular biology
- interpreting and validating the results of biomedical analyses
- preparing blood products, according to a requisition (activity reserved for medical technologists)
- resolving transfusion problems
- updating existing techniques or developing new techniques.

Within an institutional quality assurance program, carrying out quality control at each step of an analytical procedure and ensuring the proper functioning, calibration, adjustment, control and maintenance of laboratory tools and equipment are inherent in their work.

The work is carried out in a dedicated or multidisciplinary laboratory, either at a fixed workstation or at successive workstations. In the laboratory, there are frequent interactions with colleagues, other professionals and coordinators. The work is carried out in situations that are routine, or urgent or in an on-call context.

Medical technologists and medical laboratory technicians work in interdisciplinary situations with health professionals, including nursing and medical staff, and specialists such as hematologists, biochemists, microbiologists, etc.

Direct contact with clients occurs at the time when samples are taken and when analyses are conducted at the point of care, both in public and private healthcare establishments and at home.

Objectives

Statements of the Competency

Program-Specific Component

06CY Analyze the profession and training.

06CZ Carry out quality control activities in a clinical setting.

06D0 Describe the anatomical and physiological characteristics of biological samples.

06D1 Perform pre-analytical procedures to prepare samples of body fluids for biomedical analyses.

06D2 Establish professional relationships in biomedical analyses.

06D3 Procure biological samples from a client.

06D4 Perform basic quantitative analyses of biomolecules in a clinical setting.

06D5 Perform specialized quantitative analyses of biomolecules in a clinical setting.

06D6 Carry out professional activities associated with pharmacology.

06D7 Identify microorganisms.

06D8 Produce histological sections for pathological examinations.

06D9 Conduct a biological validation of the results of biomedical analyses.

06DA Perform biomedical analyses in hemostasis.

06DB Perform biomedical analyses in hematology.

06DC Perform biomedical analyses in biochemistry.

06DD Perform biomedical analyses in microbiology.

06DE Perform biomedical analyses in molecular biology.

06DF Perform analyses in transfusion medicine.

06DG Prepare blood products for transfusion.

06DH Resolve transfusion problems.

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

16⅔ credits and 420 periods of instruction, 6 credits and 150 periods of instruction

English, Language of Instruction and Literature

4EA0 Analyze and produce various forms of discourse

4EA1 Apply an analytical approach to literary genres

4EA2 Apply an analytical approach to a literary theme

4EAP Communicate in the forms of discourse appropriate to one or more fields of study

Humanities

4HU0 Apply a logical analytical process to how knowledge is organized and used

4HU1 Apply a critical thought process to world views

4HUP Apply a critical thought process to ethical issues relevant to the field of study

French as a Second Language

One objective to be met from the following:

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

One objective to be met from the following:

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

Physical Education

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

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

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

Complementary General Education Component

4 credits, 90 periods of instruction

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

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

Grid of Competencies

The grid of competencies provides an overview of a technical program. It brings together all of the components of a program and shows the relationship among the competencies.

The grid of competencies includes:

- the general competencies of the program-specific component, which deal with work-related activities common to various tasks or situations
- the specific competencies, which deal with tasks directly related to the practice of the trade or occupation

The grid of competencies shows the relationship between the general competencies on the horizontal axis and the specific competencies on the vertical axis. The symbol (○) indicates a correlation between a general and a specific competency.

The order in which the competencies are presented reflects the program's design; it does not dictate the course sequence. The grid of competencies is provided for information purposes only.

GRID OF COMPETENCIES

BIOMEDICAL LABORATORY TECHNOLOGY

SPECIFIC COMPETENCIES	Competency number	GENERAL COMPETENCIES													
		Analyze the profession and training.	Carry out quality control activities in a clinical setting.	Describe the anatomical and physiological characteristics of biological samples.	Perform pre-analytical procedures to prepare samples of body fluids for biomedical analyses.	Establish professional relationships in biomedical analysis.	Perform basic quantitative analyses of biomolecules in a clinical setting.	Perform specialized quantitative analyses of biomolecules in a clinical setting.	Carry out professional activities associated with pharmacology.	Identify microorganisms.	Conduct a biological validation of the results of biomedical analyses.				
Competency Number		1	2	3	4	5	7	8	9	10	12				
Procure biological samples from a client.	6	O	O	O	O	O									
Produce histological sections for pathological examinations.	11	O	O	O		O		O							
Perform biomedical analyses in hemostasis.	13	O	O	O	O	O	O	O	O		O				
Perform biomedical analyses in hematology.	14	O	O	O	O	O	O	O	O	O	O				
Perform biomedical analyses in biochemistry.	15	O	O	O	O	O	O	O	O	O	O				
Perform biomedical analyses in microbiology.	16	O	O	O	O	O	O	O	O	O	O				
Perform biomedical analyses in molecular biology.	17	O	O	O	O	O	O	O	O	O	O				
Perform biomedical analyses in transfusion medicine.	18	O	O	O	O	O		O	O		O				
Prepare blood products for transfusion.	19	O	O	O	O	O			O						
Resolve transfusion problems.	20	O	O	O		O			O	O	O				

Program-Specific Component

Code: 06CY

Objective

Standard

Statement of the Competency	Achievement Context
Analyze the profession and training.	• By referring to the current organization of the health and social services system • Based on current laws, regulations, standards and codes • Based on information about healthcare institutions • Using recent data on the profession

	Performance Criteria for the Competency as a Whole
	• Appropriate use of terminology specific to the field of medical biology • Taking into consideration current laws, regulations, standards and codes

Elements of the Competency	Performance Criteria
1. Understand the overall organization of the healthcare system.	• Understanding the structure of the healthcare system • Understanding: – the mission of the principal organizations and institutions in the system – the roles and responsibilities of the principal players • Accurate understanding of the organization of a healthcare institution: multidisciplinary council, health and safety committee, users' committee, etc.
2. Characterize the profession and the conditions for its practice.	• Clear and complete definition of the profession • Accurate characterization of: – workplaces – working conditions – forms of biomedical laboratory management and organization • Recognition of types of biomedical laboratories based on their respective characteristics • Appropriate understanding of career options
3. Examine the tasks associated with the profession.	• Careful examination of the tasks, the conditions under which they are performed and the associated requirements • Accurate understanding of the activities reserved for members of the Ordre professionnel des technologistes médicaux du Québec (OPTMQ)

Program-Specific Component

Elements of the Competency	Performance Criteria
4. Examine the skills and behaviours needed to practise the profession.	• Establishment of pertinent connections between skills and socioaffective behaviours needed to practise the profession, on the one hand, and tasks associated with the profession, on the other hand
5. Examine the legislation governing the practice of the profession.	• Understanding of the roles, powers and responsibilities of the main bodies associated with the profession • Detailed examination of the legislation governing the practice of the profession • Accurate understanding of the structure of the professional system in Québec, especially for health sector professions • Understanding of the legal limits of the practice of the profession
6. Make connections between the practice of the profession and the program of study.	• Accurate perception of the distrinction between the entry-level competencies required to join the workforce and the fully mature practice of the profession • Establishment of pertinent connections between training, career entry-level competencies and associated requirements • Understanding of the training process, evaluation and certification procedures, and institutional policies

Code: 06CZ

Objective

Standard

Statement of the Competency	Achievement Context
Carry out quality control activities in a clinical setting.	• Based on an institutional quality assurance program • Based on instructions, protocols and standard operating procedures • Based on current laws, regulations and standards • Using products, materials, instruments, basic analytical instruments, laboratory equipment, manufacturers' manuals, laboratory notebook, registers and software • Using personal and collective protective equipment • In collaboration with those responsible for the maintenance and repair of instrumentation and equipment

	Performance Criteria for the Competency as a Whole
	• Compliance with occupational health and safety rules, including the Workplace Hazardous Materials Information System (WHMIS) regulations • Application of sterile techniques • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Compliance with laws and regulations governing biomedical waste management • Demonstration of a sense of responsibility

Program-Specific Component

Elements of the Competency	Performance Criteria
1. Apply safe work practices in a clinical setting.	• Adherence to hygiene practices • Proper use of protective clothing and safety devices • Accurate interpretation of WHMIS data sheets • Accurate evaluation of the risks associated with handling and storage of: – chemical products – biomedical products • Adequate control of physical risk • Proper management of chemical wastes • Appropriate management of biomedical wastes
2. Apply procedures to ensure the reliability of instruments in a biomedical laboratory.	• Correct application of the instrument maintenance and calibration techniques recommended by the manufacturers • Appropriate use of quality control materials • Validation of results that meet quality control criteria and detection of results that do not • Correct application of the methods for preserving and storing control samples recommended by the manufacturers • Correct application of the internal quality control program • Correct application of the external quality control program
3. Take corrective action when quality control results are not compliant with acceptable standards.	• Precise identification of the type of error causing the noncompliance • Correct consultation of protocols and manufacturers' manuals or technical resources • Proper application of the corrective action indicated for the particular type of error
4. Document activities carried out within the framework of a quality assurance program.	• Rigorous maintenance of a laboratory notebook • Accurate recording of data obtained from quality control activities • Accurate and complete documentation of anomalies, incidents and any other event that might occur • Appropriate archiving of laboratory results and data
5. Apply intervention protocols in case of an accident.	• Strict adherence to protocols in case of: – Incidents involving people – leaks or spills of infectious materials – leaks or spills of hazardous chemical products – fire

Code: 06D0

Objective — *Standard*

Statement of the Competency	Achievement Context
Describe the anatomical and physiological characteristics of biological samples.	• For the purpose of taking biological samples from a person • In order to perform biomedical analyses, including the preparation of samples for analysis • For the purpose of the biological validation of the results of biomedical analyses • Using human biological samples and body fluids: blood, urine, secretions and expectorations • Using reference materials and other documents

	Performance Criteria for the Competency as a Whole
	• Efficient use of reference materials and technical documentation • Appropriate use of terminology specific to the field of medical biology

Elements of the Competency	Performance Criteria
1. Consider the structure of the human body as a whole.	• Accurate location of the parts of the body • Appropriate understanding of the structural links between the parts of the body • Correct overall description of the anatomy of organs and systems of the human body
2. Consider the human body as a group of interconnected systems.	• Precise understanding of the function and overall integration of systems and organs • Accurate understanding of the main functional links between systems and organs
3. Define the composition of body fluids submitted to basic biomedical analyses.	• Methodical use of the criteria for macroscopic descriptions of biological fluids • Accurate understanding of the characteristics of the matrix and physiochemical properties of body fluids • Precise identification of the basic analytes of each of the body fluids

Program-Specific Component

Elements of the Competency	Performance Criteria
4. Relate biological samples to sampling sites.	• Precise determination of the source of the body fluid to be sampled or collected • Correct identification of the mechanisms that produce or form liquids • Location of sampling sites according to the nature of the sample
5. Associate samples of body fluids and the biomedical analyses performed on them.	• Appropriate association of each body fluid with the relevant routine biomedical analyses • Precise identification of the analytes that are analyzed routinely • Precise recognition of the normal reference values for the principal analytes of each body fluid

Code: 06D1

Objective — *Standard*

Statement of the Competency	Achievement Context
Perform pre-analytical procedures to prepare samples of body fluids for biomedical analyses.	• Using biological samples • Based on a requisition • Based on instructions, protocols and standard operating procedures • Based on current laws, regulations and standards • Using products, materials, laboratory instruments and equipment such as centrifuges, stainers and microscopes as well as software and documentation

	Performance Criteria for the Competency as a Whole
	• Compliance with workplace health and safety rules • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Compliance with regulations with respect to the handling and transportation of biological samples

Elements of the Competency	Performance Criteria
1. Triage the samples.	• Priority given to samples for which an urgent analysis is requested • Appropriate choice and effective application of a triage method for a batch of samples
2. Verify the acceptability of biological samples.	• Assessment of the conformity of samples with the requisition • Application of the technical procedures required according to the types of analyses requested • Accurate entry of data in the recording system
3. Perform a macroscopic examination of biological samples.	• Accurate recognition of macroscopic characteristics, including quantity, appearance, colour, odour, weight, turbidity and viscosity • Accurate measurement of the volume • Exact recording of data

Program-Specific Component

Elements of the Competency	Performance Criteria
4. Prepare biological samples for biomedical analyses.	• Appropriate choice of sample preparation according to the nature of the sample and the analyses requested • Strict application of selected preparation methods, including: – homogenization – decantation – filtration – centrifugation – dilution – washing • Assessment of the quality of the preparation • Application of appropriate corrective measures, if necessary
5. Prepare biological samples for microscopic examination.	• Proper preparation of samples for wet examination • Proper preparation of a stained smear • Assessment of the quality of the preparation • Application of appropriate corrective measures, if necessary
6. Distribute the biological samples.	• Proper aliquoting of samples into the appropriate containers • Proper distribution of samples to the appropriate areas • Proper handling of samples to be sent outside the laboratory in compliance with: – packaging standards – labelling standards – the requisition – the regulations on the transport of hazardous substances
7. Store the biological samples.	• Appropriate choice of storage method depending on the nature of the sample • Compliance with the timeframe for storing samples • Proper storage of samples • Accurate documentation of sample storage information

Code: 06D2

Objective — *Standard*

Statement of the Competency	Achievement Context
Establish professional relationships in biomedical analysis.	• In a variety of professional situations in a clinical setting • With a variety of clients • With other health professionals • Based on current laws and regulations • Based on the healthcare institution's procedures • Based on patient files and analytical results • Using occupational and technical documentation, widely used software and management software for analytical results

	Performance Criteria for the Competency as a Whole
	• Compliance with the Code de déontologie des technologistes médicaux • Compliance with the guidelines and rules of practice of the Ordre professionnel des technologistes médicaux du Québec (OPTMQ) • Appropriate use of terminology specific to the field of medical biology • Respect for the roles and responsibilities of other workers • Openness to and respect for different points of view and the opinions of others

Elements of the Competency	Performance Criteria
1. Interact with patients in routine situations.	• Use of an interpersonal approach that is socially and culturally adapted to the person and the situation • Accurate transmission of professional information (role, nature of the activity, directives for taking a sample or pertaining to an analysis, instructing the patient, etc.) • Verification that the information transmitted has been understood • Pertinence and clarity of requests for information addressed to patients or their caregivers. • Checking that the information on the patient corresponds with that on the requisition

Program-Specific Component

Elements of the Competency	Performance Criteria
2. Interact with patients in particular situations that are specific or delicate on the human level.	• Consideration of the overall condition and behaviour of the patient and, if applicable, that of the caregivers • Strict application of the protocol established for the current situation • Promptness in reporting the situation and calling on resource people, as needed
3. Work in a team in a biomedical laboratory.	• Effective participation in the setting of priorities and work deadlines • Demonstration of a concern for efficiency in the planning and organization of work • Demonstration of mutual help and solidarity with colleagues • Transmission of accurate and complete information at shift changes • Appropriate contribution to solving problems and making decisions
4. Work in interdisciplinary situations.	• Use of a socially and culturally adapted interpersonal approach • Appropriate coordination of one's activities with those of other professionals • Demonstration of a concern for efficiency in the planning and organization of work • Judicious use of one's power to influence • Affirmation of one's competency when the situation requires it • Appropriate contribution to solving problems and making decisions
5. Communicate the results of the analysis.	• Use of a socially and culturally adapted interpersonal approach • Appropriate coordination of one's activities with those of other professionals • Demonstration of a concern for efficiency in the planning and organization of work • Judicious use of one's power to influence • Affirmation of one's competency when the situation requires it • Appropriate contribution to solving problems and making decisions • Strict application of the institutional procedures for saving, consulting and tracking files • Strict adherence to standards, laws and regulations covering reportable diseases • Strict application of institutional procedures with respect to communicating the results of the analysis • Respect for the confidentiality of information

Elements of the Competency	Performance Criteria
6. Manage the stress inherent in practising the profession.	• Awareness of stress factors at work • Examination of one's ability to deal with stress in the workplace: physiological and psychological reactions to stress and one's limits at the professional level • Informed choice of ways to help: – reduce stress – improve the ability to manage stress in a professional situation • Clear concern for maintaining a physical and psychological balance

Code: 06D3

Objective — *Standard*

Statement of the Competency	Achievement Context
Procure biological samples from a client.	• In routine or emergency situations • With a variety of clients • From different parts of the body • Based on current laws, regulations, standards and codes • Based on a requisition or precise request of medical staff • Using products, materials and equipment, documentation and software • In collaboration with other health professionals

	Performance Criteria for the Competency as a Whole
	• Compliance with the *Professional Code* • Compliance with the *Code de déontologie des technologistes médicaux* • Compliance with the guidelines and rules of practice of the Ordre professionnel des technologistes médicaux du Québec (OPTMQ) • Compliance with workplace health and safety rules • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Proper management of stress

Elements of the Competency	Performance Criteria
1. Organize the work.	• Correct interpretation of the requisition or request with respect to the prescribed analyses and the samples to be collected • Correct interpretation of instructions and protocols • Precise transcription of the information from the requisition • Taking into consideration the priority level of the requisition, if applicable • Proper preparation of the materials, and in sufficient quantity, in accordance with the nature and number of samples to be collected

Program-Specific Component

Elements of the Competency	Performance Criteria
2. Greet the patient.	• Introduction and welcome adapted to the patient • Rigorous verification and confirmation of the patient's identity • Clear statement of the pertinent information • Careful verification that the patient has followed the requirements for the analysis • Obtaining of the patient's consent
3. Take the patient's vital signs.	• Proper taking of vital signs • Appropriate interpretation of the results obtained • Promptness in asking other professionals for help in cases of adverse clinical manifestations
4. Choose the site for collection of the sample.	• Appropriate choice of sample collection site, taking into account: – the type of collection – anatomical and physiological data • Sterilization of the sample collection site in accordance with the type of analysis requested
5. Take blood samples.	• Correct application of techniques for collecting blood samples through puncture of a capillary or vein • Collection of samples in sufficient quantity
6. Collect secretions originating from the: – nose – throat – nasopharynx (by swabbing) – eyes – ears – skin and sores	• Careful choice of the collection technique in accordance with the nature of the secretions • Correct application of sample collection techniques
7. Obtain or collect other types of samples, including urine, stool, expectoration or sperm.	• Careful choice of collection technique, depending on the nature of the sample to be obtained • Transmission of clear and complete instructions to the patient in order to obtain a sample that meets the requirements
8. Ensure that the samples are properly handled.	• Correct labeling of samples • Compliance with storage instructions • Proper transporting of samples to the laboratory: – completed with diligence – in compliance with the prescribed rules for transportation
9. Follow up with the patient.	• Clear explanation of the instructions to be followed • Courteous dismissal of the patient at an opportune moment

Code: 06D4

Objective

Standard

Statement of the Competency	Achievement Context
Perform basic quantitative analyses of biomolecules in a clinical setting.	• Using biological samples • Based on instructions, protocols and standard operating procedures • Using products, materials, basic laboratory instruments and equipment such as automated wet and dry chemical devices, electrochemical and osmometric instruments, spectrophotometers, particle counting system, microscopes, a scale, automated pipettes and dilutors as well as software and paper or electronic registers • Using manufacturers' manuals

	Performance Criteria for the Competency as a Whole
	• Compliance with workplace health and safety rules, including WHMIS regulations • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Compliance with regulations governing biomedical waste management

Elements of the Competency	Performance Criteria
1. Prepare solutions and reagents to conduct basic quantitative analyses.	• Proper choice of components, solutions and reagents • Correct interpretation and strict application of protocols • Exact calculations of the quantity of components required to prepare reagents and solutions • Taking the characteristics of components into consideration in accordance with the WHMIS • Proper selection and use of volumetric and laboratory instruments • Labelling of solutions and reagents in compliance with WHMIS regulations

Program-Specific Component

Elements of the Competency	Performance Criteria
2. Prepare the analytical instrument or the automated line.	• Correct interpretation of diagrams and instructions for operating the instruments or automated line • Maintenance carried out in accordance with the manufacturer's instructions • Correct loading of solutions and reagents • Precise and accurate calibration • Strict application of a quality control program • Correct loading of samples • Precise programming of requested analyses, if necessary
3. Quantify the biomolecules using basic analytical methods.	• Proper use of analytical instruments or automated line – spectrophotometry – electrochemical system – osmometer – particle counting system • Exact and precise determination of the concentration of biomolecules • Correct processing of the results generated • Comparison of the quantitative analytical results with standard diagnostic reference values
4. Perform qualitative or quantitative examinations using a: – bright-field microscope – polarising light microscope – phase-contrast microscope – dark-field microscope – fluorescence microscope	• Correct interpretation of diagrams and instructions for operating the different types of microscope • Correct preparation of slides, if necessary • Correct placement of slides • Proper use and adjustment of microscopes • Exact qualitative and quantitative interpretation of observed slides • Maintenance and storage carried out in compliance with the manufacturer's instructions
5. Record laboratory data and results.	• Recording of exact information in a register: – maintenance data – calibration data – quality control results – operating problems • Recording of data and results from the analyses in accordance with the prescribed rules
6. Put away materials.	• Proper cleaning of instruments, equipment and work areas • Proper storage of materials, equipment and samples • Compliance with regulations governing biomedical waste management

Code: 06D5

Objective

Standard

Statement of the Competency	Achievement Context
Perform specialized quantitative analyses of biomolecules in a clinical setting.	• Using biological samples • Based on instructions, protocols and standard operating procedures • Using products, materials, laboratory instruments and equipment such as devices for gel electrophoresis, high-performance liquid chromatograph, an immunoassay apparatus (ELISA and EMIT), a chemiluminescence detection device, UV VIS spectrophotometer and microscopes as well as software and registers • Using manufacturers' manuals

	Performance Criteria for the Competency as a Whole
	• Compliance with workplace health and safety rules, including WHMIS regulations • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Compliance with regulations governing biomedical waste management

Elements of the Competency	Performance Criteria
1. Prepare solutions and reagents to conduct specialized quantitative analyses.	• Proper choice of components, solutions and reagents • Correct interpretation and strict application of protocols • Exact calculations of the quantity of components required to prepare reagents and solutions • Taking the characteristics of components into consideration in accordance with the WHMIS • Proper selection and use of volumetric and laboratory instruments • Labelling of solutions and reagents in compliance with the WHMIS regulations

Program-Specific Component

Elements of the Competency	Performance Criteria
2. Prepare the biological samples.	• Strict consideration of the: – nature of the biological sample to be analyzed – specialized quantitative analytical method to be used • Correct application of instructions for preparing samples
3. Prepare the analytical instrument or the automated line.	• Correct interpretation of diagrams and instructions for operating the instruments or automated line • Maintenance carried out in accordance with the manufacturer's instructions • Correct loading of solutions and reagents • Precise and accurate calibration • Strict application of a quality control program • Correct loading of samples • Taking into account of internal and external variables that have an influence on analytical methods and results • Establishment of optimal technical conditions
4. Perform a qualitative and quantitative assay of biomolecules using electrophoresis.	• Separation of biomolecules according to their physicochemical characteristics • Continuous evaluation of the device's performance during the migration process • Precise qualitative evaluation of separated biomolecules based on the electrophoretic pattern • Exact determination of the concentration of separated and identified biomolecules • Performance of post-analytical calculations in order to obtain definitive results • Correct comparison of the results with standard diagnostic reference values
5. Perform a qualitative and quantitative assay of biomolecules using chromatography.	• Separation of biomolecules according to their physicochemical characteristics • Continuous evaluation of the device's performance during the separation process • Precise qualitative identification of separated biomolecules based on a chromatographic pattern • Exact determination of the concentration of separated and identified biomolecules • Performance of post-analytical calculations in order to obtain definitive results • Correct comparison of the results with standard diagnostic reference values

Elements of the Competency	Performance Criteria
6. Perform a qualitative and quantitative assay of biomolecules using immunological techniques.	• Effective control of internal and external variables in accordance with the particularities of antigens and antibodies • Precise qualitative evidence of the presence of antigens or antibodies • Exact quantitative assay of antigens or antibodies • Performance of appropriate post-analytical calculations in order to obtain definitive results • Correct interpretation of the results • Correct comparison of the results with standard diagnostic reference values
7. Measure enzyme activity.	• Correct evidence of an enzymatic reaction • Effective control of variables that influence enzymatic reactions • Performance of appropriate post-analytical calculations in order to obtain definitive results • Exact determination of the level of activity of clinically significant enzymes • Correct comparison of the results with standard diagnostic reference values
8. Record laboratory data and results.	• Recording of exact information in a register: – maintenance data – calibration data – quality control results – operating problems • Recording of data and results from the analyses in accordance with the prescribed rules
9. Put away materials.	• Proper cleaning of instruments, equipment and work areas • Proper storage of materials, equipment and samples • Compliance with regulations governing biomedical waste management

Code: 06D6

Objective	*Standard*
Statement of the Competency	**Achievement Context**
Carry out professional activities associated with pharmacology.	• In preparation for biomedical analyses in the laboratory and occasional point of care biomedical analyses • For the purpose of the biological validation of results of biomedical analyses • In direct contact with patients • Based on medical requisitions • Based on instructions, protocols and standard operating procedures • Using patients' medical files • Using the package insert or monograph that accompanies the prescribed medication • Using reference materials • With the material for mixing substances and administration of medications or other substances • In collaboration with other health professionals

	Performance Criteria for the Competency as a Whole
	• Efficient consultation of reference materials • Compliance with the *Professional Code* • Compliance with the *Code de déontologie des technologistes médicaux* • Compliance with the guidelines and rules of practice of the Ordre professionnel des technologistes médicaux du Québec (OPTMQ) • Compliance with workplace health and safety rules • Application of sterile techniques

Program-Specific Component

Elements of the Competency	Performance Criteria
1. Interpret a medical prescription with regard to pharmacological data.	• Correct identification of the medication's class and subclass • Correct interpretation of terminology and abbreviations • Precise understanding of the: – pharmaceutical form – dosage – route of administration
2. Characterize the prescribed medication of the substance in terms of the basic principles of pharmacokinetics and pharmacodynamics.	• Precise knowledge of the mechanisms for the absorption, distribution and elimination of the medication • Knowledge of the specific metabolism of a drug in the body • Exact knowledge of the: – medication's mechanism of action – medication's sites of action – desired physiological effects on the human body's different systems – adverse, side or toxic effects – drug interactions • Taking into consideration the variables that influence the action of the medication or substance: physical, psychological and environmental factors, age, genetics, nutrition, allergies, ethnicity, etc.
3. Make the connection between the substance or prescribed medication and the principal biomedical analyses.	• Recognition of medicinal substances used to make a diagnosis • Recognition of medications used for therapeutic follow-up • Recognition of the effect of pharmacotherapy on the results of biomedical analyses
4. Mix substances in order to complete the preparation of a medication.	• Correct reading and interpretation of labels • Systematic verification of the expiry date and storage method • Accuracy of pharmacological calculations, if necessary • Preparation of the medication in accordance with the prescription • Proper storage of medications and substances in accordance with the manufacturer's requirements

Elements of the Competency	Performance Criteria
5. Administer medications or other substances in order to perform biomedical analyses.	• Obtaining of the patient's consent • Administration of the medication or other substances in accordance with the prescription • Promptness in asking a resource person for help in cases of adverse clinical manifestations • Compliance with regulations governing management of biomedical wastes and medications
6. Provide patients with information about the prescribed medication or substance in preparation for a biomedical analysis.	• Clear and complete explanation of the instructions to follow before and after the administration of the medication or substance • Clear and complete explanation of the desired effects of the medication or substance and, if applicable, the adverse effects and contraindications

Code: 06D7

Objective *Standard*

Statement of the Competency	Achievement Context
Identify microorganisms.	• For prokaryotae and eukaryotae, fungi, protozoae and viruses • Based on a requisition • Using biological samples that could contain microorganisms • Based on instructions, protocols and standardized operating procedures • Using products, detection and identification kits, materials, basic laboratory instruments, equipment such as sterilizers, culture medium preparation device, incubators and microscopes, and specialized identification software and documentation.

	Performance Criteria for the Competency as a Whole
	• Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Compliance with Canadian Standards Association (CSA) standards • Compliance with Clinical and Laboratory Standards Institute standards

Elements of the Competency	Performance Criteria
1. Prepare materials and various products.	• Accurate preparation of solutions, reagents, stains and culture media • Preparation of culture media and sterile materials • Appropriate storage of solutions, reagents, stains and culture media
2. Cultivate microorganisms.	• Appropriate choice of culture medium in accordance with the nature of the biological sample • Sterile inoculation on the culture media • Choice and implementation of optimal conditions for growing microorganisms taking their nutritional needs, metabolism and reproduction into account • Isolation of microorganisms in order to obtain individual bacterial colonies

Program-Specific Component

Elements of the Competency	Performance Criteria
3. Maintain microorganism cultures.	• Proper choice of culture storage methods • Planning of subculturing in accordance with quality assurance standards • Viability of the cultures
4. Detect microorganisms.	• Strict consideration of growth characteristics of microorganisms in a culture medium, including shape, appearance, odour and surface • Precise detection of microorganisms by: – a microscopic examination of samples in a wet mount – staining, including Gram differential staining • Correct enumeration of the colonies
5. Identify genus and species of microorganisms.	• Identification of the genus by: – examining morphological characteristics – performing conventional and rapid biochemical tests – staining • Identification of the species using: – serological tests – test kits • Correct interpretation of results
6. Make the presumptive identification of microorganisms and validate it.	• Making of the presumptive identification of microorganisms based on the entire set of results obtained • Validation of the presumptive identification by an efficient consultation of a database • Agreement between the results obtained and the presumptive identification
7. Decontaminate the materials, equipment and workstation.	• Correct assessment of the risks associated with handling microorganisms • Correct application of physical or chemical decontamination methods • Proper management of contaminated wastes • Appropriate emergency action in the case of a spill of or exposure to microorganisms

Code: 06D8

Objective	*Standard*
Statement of the Competency	**Achievement Context**
Produce histological sections for pathological examinations.	• In routine or emergency situations • Using human samples, including anatomical tissue samples and complete organs • Based on a requisition or specific request from medical staff • Based on instructions, protocols and standard operating procedures • Using products, analytical instruments, equipment such as an automated tissue processor, a microtome, a cryostat, an embedding station, a stainer, an automated blade holder, an image capture system and a microwave apparatus as well as microscopes and specialized software • In collaboration with the pathologist, his or her assistant and other health professionals

	Performance Criteria for the Competency as a Whole
	• Compliance with the guidelines and rules of practice of the Ordre professionnel des technologistes médicaux du Québec (OPTMQ) • Compliance with workplace health and safety rules • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Compliance with current standards and recommendation for the handling and transportation of biological samples • Clear concern for the quality of the work and efficiency

Program-Specific Component

Elements of the Competency	Performance Criteria
1. Receive human samples.	• Verification of the correspondence between the requisition and the samples received • Meticulous verification of the presence of all required information • Efficient verification of the integrity of the sample • Appropriate handling of samples in accordance with their nature and characteristics • Correct prioritization for processing samples
2. Perform an overall macroscopic examination of the samples.	• Exact differentiation of organs with respect to their anatomical characteristics • Precise overall macroscopic examination of: – routine samples – biopsies – scrapings – non-complex anatomical parts • Appropriate sampling of non-complex anatomical parts • Correct recording of: – overall macroscopic characteristics of samples, including dimensions, volume, weight, overall appearance and colour – other observations considered to be relevant
3. Subject the samples to different preparatory processes.	• Strict application of fixation techniques, taking the request into account • Appropriate decalcification when required based on the nature of the sample • Proper processing of tissue samples • Proper embedding of sample pieces • Correct use of complementary preparatory processes, including the freezing of an entire organ or samples • Correct assessment of the quality of processing of tissue samples • Application of appropriate corrective measures, if necessary
4. Produce histological sections.	• Precise microtomy of sample pieces • Appropriate use of cryotomy techniques • Spreading, drying and precise mounting of histological sections • Correct assessment of the quality of the preparation • Application of appropriate corrective measures, if necessary • Compliance with the timeframe set by the institution for the production of histological sections in an emergency situation

Elements of the Competency	Performance Criteria
5. Stain the tissue and specific structures.	• Proper preparation of solutions and reagents required for staining in accordance with the requisition • Proper staining of tissues, using routine techniques • Precise staining of specific tissue structures using special staining techniques
6. Detect antigens.	• Correct choice of fixative, if necessary • Choice of technique for detecting the desired tissue antigen • Proper application of immunological techniques
7. Assess the quality of staining.	• Correct choice of microscope in accordance with the type of staining used • Precise identification of stained tissue structures • Confirmation of the exact identity of the organ based on the stained morphological characteristics • Clean and clear distinction of cell components by the stain used • Application of appropriate corrective measures, if necessary
8. Maintain the instrument.	• Meticulous maintenance of the parts of the microtome • Careful verification that devices are operating properly • Appropriate corrective action for minor problems with the operation of instruments • Proper disinfection of the instrument
9. Manage materials.	• Proper preparation of samples for sending outside the institution • Appropriate cleaning of equipment, instruments and work areas • Compliant storage of materials and samples • Precise classification of histological blocks and blades • Compliance with regulations governing biomedical waste management

Code : 06D9

Objective *Standard*

Statement of the Competency	Achievement Context
Conduct a biological validation of the results of biomedical analyses.	• Based on a requisition or specific requests from medical staff • Using post-analytical results in hemostasis, hematology, biochemistry, microbiology and transfusion medicine and with the help of the findings of histopathological examinations • Following an analytical validation of the results of biomedical analyses • Based on information provided by other health professionals • Using patient medical files • Using specialized software or manually

	Performance Criteria for the Competency as a Whole
	• Observance of the reference values of the health institution • Accuracy of the analysis and the synthesis of the information • Compliance with the protocols for managing the results of biomedical analyses

Elements of the Competency	Performance Criteria
1. Interpret the results of biomedical analyses with regard to the reference values.	• Correct interpretation of the results of analyses: – normal values – pathological values – critical values and panic values – abnormal values – aberrant values • Correct use of software for validating results

Program-Specific Component

Elements of the Competency	Performance Criteria
2. Correlate the analytical results with the clinical information in the medical file.	• Correct interpretation of the results with regard to the information about the patient: – demographic information (age, gender, ethnic background, life situation, job, etc.) – medical information (normal or pathological state of health) – established diagnosis, if applicable – therapeutic treatments (including medication), if applicable – therapeutic follow-up, if applicable • Taking into account of the fact that the analyses are of samples from a population considered to be healthy or diseased or, from a population at risk or in a care unit
3. Correlate the para-analytical results with the other laboratory data.	• Correct determination of the concurrence or lack of concurrence between the current results and the previous results: – analyses carried out in the same field of medical biology – analyses carried out in other fields of medical biology – analyses carried out in another health institution – delta check
4. Apply an investigative protocol in cases of abnormal or aberrant values.	• Precise and exact determination of the causes of interference, mainly with respect to: – the analytical process and method – the taking of medications – the quality of the sampling – the type of sampling – the preparation of the samples – the preservation of the samples – other causes of interference
5. Apply a protocol for following up on the results in the case of an urgent situation.	• Priority given to: – urgent requisitions – cases where critical or panic values are present • Communication of the results within the timeframes prescribed by the institution • Use of an appropriate and efficient means of transmitting the results

Code : 06DA

Objective — *Standard*

Statement of the Competency	Achievement Context
Perform biomedical analyses in hemostasis.	• For analyses in hemostasis performed in the laboratory and, occasionally, for analyses performed at point of care • Using blood samples • Based on a requisition or specific request from medical staff • Based on instructions, protocols and standard operating procedures • Using products, materials, basic laboratory instruments and analytical equipment, equipment such as a blood clot detection device, software and documentation • In collaboration with other health professionals

	Performance Criteria for the Competency as a Whole
	• Compliance with the Code de déontologie des technologistes médicaux • Compliance with the guidelines and rules of practice of the Ordre professionnel des technologistes médicaux du Québec (OPTMQ) • Compliance with workplace health and safety rules • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Clear concern for the quality of the work and efficiency

Elements of the Competency	Performance Criteria
1. Organize the work.	• Correct interpretation of the requisition or specific request • Correct interpretation of instructions and protocols • Observance of storage periods and conditions for samples • Correct setting of analytical priorities

Program-Specific Component

Elements of the Competency	Performance Criteria
2. Prepare the materials, instruments and equipment.	• Appropriate preparation of solutions, reagents and laboratory instruments • Maintenance performed in accordance with the manufacturer's instructions • Precise and accurate calibration • Strict application of a quality control program • Careful verification that devices are operating properly • Correct loading of samples and precise programming of the requested analyses • Satisfactory resolution of minor problems with the operation of instruments
3. Prepare the blood samples.	• Proper application of the sample preparation method in accordance with the nature of the sample and the type of analysis or examination • Appropriate handling of fresh and frozen samples • Appropriate handling of a batch of samples • Observance of the specific conditions for hemostasis samples
4. Perform routine analyses in hemostasis.	• Proper investigation of the primary hemostasis by: – determining bleeding time – determining platelet count – measuring platelet aggregation – measuring closure time • Proper investigation of clotting mechanisms by: – determining prothrombin time (PT) – determining activated thromboplastin time – determining thrombin time – calculating the international normalized ratio (INR) – using platelet lysate for the platelet neutralization procedure (PNP)
5. Assay the factors responsible for the hemostasis.	• Correct measurement of: – fibrinogen – other clotting factors – principal inhibitors of clotting
6. Detect antibodies and a circulating anticoagulant.	• Accurate detection of antibodies: – antiphospholipid – factor VIII – anti-heparin – other antibodies, if necessary • Accurate detection of a circulating anticoagulant
7. Assay the molecules responsible for fibrinolysis.	• Exact measurement of: – D-dimer (fibrin degradation product) – plasminogen and tPA – fibrinolysis inhibitor, including antiplasmin

Elements of the Competency	Performance Criteria
8. Perform biomedical analyses at the point of care, such as: – bleeding time – circulating anticoagulant	• Compliance with institutional instructions: – analytical requirements, patient's consent, etc. • Preparation of materials or instruments in accordance with the requisition • Strict application of a quality control program • Proper performance of analyses • Appropriate action if there are clinical manifestations • Promptness in calling upon a resource person for help, if needed • Appropriate follow-up with the patient regarding the analysis performed
9. Interpret the results.	• Appropriate processing of data • Verification of the analytical validation of the results • Verification of the biological validation of the results • Strict application of the protocol for following up on the results, if necessary
10. Produce a report and communicate the results.	• Exact recording of the results • Affixing of a legible signature, initials or personal identification code • Choice and use of an appropriate means for reporting the results • Respect for confidentiality
11. Put away materials.	• Appropriate cleaning of equipment, instruments and work areas • Compliant storage of materials and samples • Compliance with regulations governing biomedical waste management

Code : 06DB

Objective — *Standard*

Statement of the Competency	Achievement Context
Perform biomedical analyses in hematology.	• Using blood samples and samples of body fluids other than blood • Based on a requisition or specific request from medical staff • Based on instructions, protocols and standard operating procedures • Using products, materials, basic laboratory instruments and analytical equipment, equipment such as a stainer, centrifuge, cytocentrifuge, automated cell counter or flow cytometer, different types of microscopes, cell recognition software and documentation • In collaboration with other health professionals

	Performance Criteria for the Competency as a Whole
	• Compliance with the guidelines and rules of practice of the Ordre professionnel des technologistes médicaux du Québec (OPTMQ) • Compliance with workplace health and safety rules • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Clear concern for the quality of the work and efficiency

Elements of the Competency	Performance Criteria
1. Organize the work.	• Correct interpretation of the requisition or specific request • Correct interpretation of instructions and protocols • Observance of storage periods and conditions for samples • Correct setting of analytical priorities

Program-Specific Component

Elements of the Competency	Performance Criteria
2. Prepare the materials, instruments and equipment.	• Appropriate preparation of solutions, reagents, stains and laboratory instruments • Maintenance performed in accordance with the manufacturer's instructions • Precise and accurate calibration • Strict application of a quality control program • Careful verification that devices are operating properly • Correct loading of samples and precise programming of the requested analyses • Satisfactory resolution of minor problems with the operation of instruments
3. Prepare the blood samples.	• Proper application of the sample preparation method in accordance with the nature of the sample and the type of analysis or examination • Appropriate handling of a batch of samples • Respect for the specific conditions for hematology samples
4. Perform routine hematology analyses.	• Exact determination of the sedimentation rate • Determination of a complete blood count
5. Perform complementary hematology analyses.	• Exact microscopic count of white blood cells and platelets, using a hemocytometer • Microscopic estimation of the number of white blood cells and the number of platelets in a blood smear • Detailed microscopic examination of the morphology of red blood cells, white blood cells and platelets in a blood smear • Precise differential count of normal or abnormal leukocytes • Exact count of reticulocytes
6. Perform specialized hematology analyses used to diagnose: – anemias – leukemias – other hematological disorders	• Strict application of analytical methods for detecting anemias • Strict application of analytical methods for detecting leukemias • Strict application of analytical methods for detecting other hematological disorders
7. Perform analyses of body fluids other than blood, e.g. cerebrospinal fluid, synovial fluid, etc.	• Accurate macroscopic description of the sample • Proper application of the preparation method for the type of sample • Biological fluid analysis in compliance with institutional standards • Observance of the specific conditions for the type of body fluid

Elements of the Competency	Performance Criteria
8. Interpret the results.	• Appropriate processing of data • Verification of the analytical validation of the results • Verification of the biological validation of the results • Strict application of the protocol for following up on the results, if necessary
9. Produce a report and communicate the results.	• Exact recording of the results • Affixing of a legible signature, initials or personal identification code • Choice and use of an appropriate means for reporting the results • Respect for confidentiality
10. Put away materials.	• Appropriate cleaning of equipment, instruments and work areas • Compliant storage of materials and samples • Compliance with regulations governing biomedical waste management

Code : 06DC

Objective — *Standard*

Statement of the Competency	Achievement Context
Perform biomedical analyses in biochemistry.	• For analyses in biochemistry performed in the laboratory and, occasionally, for analyses performed at point of care • Using samples of body fluids • Based on a requisition or specific request from medical staff • Based on instructions, protocols and standard operating procedures • Using products, materials, basic laboratory instruments and analytical equipment, equipment such as a multiple analyzer for liquid and dry chemicals, blood gas analyzer and osmometer, and with the help of a urinalysis test strip reader, gel electrophoresis system, high-performance liquid chromatograph, immunoassay instrument, chemiluminescence detection device, nephelometer, spectrophotometers, different types of microscopes, software and registers • In collaboration with other health professionals

	Performance Criteria for the Competency as a Whole
	• Compliance with the guidelines and rules of practice of the Ordre professionnel des technologistes médicaux du Québec (OPTMQ) • Compliance with workplace health and safety rules • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Clear concern for the quality of the work and efficiency

Program-Specific Component

Elements of the Competency	Performance Criteria
1. Organize the work.	• Correct interpretation of the requisition or specific request • Correct interpretation of instructions and protocols • Observance of storage periods and conditions for samples • Correct setting of analytical priorities
2. Prepare the materials, instruments and equipment.	• Appropriate preparation of solutions, reagents and laboratory instruments • Maintenance performed in accordance with the manufacturer's instructions • Precise and accurate calibration • Strict application of a quality control program • Careful verification that devices are operating properly • Correct loading of samples and precise programming of the requested analyses • Satisfactory resolution of minor problems with the operation of instruments
3. Prepare the biological samples.	• Proper application of the sample preparation method in accordance with the nature of the sample and the type of analysis or examination • Appropriate handling of fresh and frozen samples • Appropriate handling of a batch of samples • Observance of the specific conditions for biochemical analysis
4. Perform routine biochemical analyses.	• Proper performance of analytical workups, that is: – basic metabolic – renal – cardiac – hepatic – lipid – specific hormone • Proper performance of pregnancy tests, using blood and urine
5. Perform complementary biochemical analyses.	• Precise measurement of: – Blood gases and pH – electrolytes – osmolality • Proper performance of an iron workup • Proper performance of a toxicology workup • Precise measurement of: – vitamins – antibodies – tumour markers – cardiac markers – other biomolecules

Elements of the Competency	Performance Criteria
6. Perform specialized biochemical analyses using chromatography and electrophoresis.	• Accurate qualitative or quantitative determination of biomolecules, including: – glycated hemoglobin – drugs – toxic substances – separated biomolecules
7. Examine urine and stool samples.	• Appropriate macroscopic and microscopic examinations of urine samples • Appropriate macroscopic examination of stools • Methodical search for occult blood in stools
8. Perform biomedical analyses at point of care, such as the: – measurement of blood sugar levels – sweat test – lactose intolerance test – qualitative pregnancy test	• Compliance with institutional instructions: – analytical requirements, patient's consent, etc. • Preparation of materials or instruments in accordance with the requisition • Proper performance of analyses • Appropriate action if there are clinical manifestations • Promptness in calling on a resource person for help, if needed • Appropriate follow-up with the patient regarding the analysis performed
9. Interpret the results.	• Appropriate processing of data • Verification of the analytical validation of the results • Verification of the biological validation of the results • Strict application of the protocol for following up on the results, if necessary
10. Produce a report and communicate the results.	• Exact recording of the results • Affixing of a legible signature, initials or personal identification code • Choice and use of an appropriate means for reporting the results • Respect for confidentiality
11. Put away materials.	• Appropriate cleaning of equipment, instruments and work areas • Compliant storage of materials and samples • Compliance with regulations governing biomedical waste management

Code : 06DD

Objective	*Standard*
Statement of the Competency	**Achievement Context**
Perform biomedical analyses in microbiology.	• Based on a requisition or specific request from medical staff • Using biological samples that potentially contain microorganisms • Based on instructions, protocols and standard operating procedures • Using products, materials, basic laboratory instruments and analytical instruments, equipment such as a spectrophotometer and a device for making culture media, different types of microscopes, immunoassay instruments, incubators, laminar flow hoods, an automated bacterial identification and antibiotic therapy device, a DNA amplification device (PCR), automated blood culture and mycobacteria testing instruments, specialized identification software and documentation • In collaboration with other health professionals

	Performance Criteria for the Competency as a Whole
	• Compliance with the guidelines and rules of practice of the Ordre professionnel des technologistes médicaux du Québec (OPTMQ) • Compliance with workplace health and safety rules • Application of sterile techniques • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Compliance with the rules of the Clinical and Laboratory Standards Institute • Clear concern for the quality of the work and efficiency

Program-Specific Component

Elements of the Competency	Performance Criteria
1. Organize the work.	• Correct interpretation of the requisition or specific request • Correct interpretation of instructions and protocols • Observance of storage periods and conditions for samples • Correct setting of analytical priorities
2. Prepare the materials and laboratory equipment.	• Appropriate preparation of solutions, reagents, stains, culture media and laboratory instruments • Maintenance performed in accordance with the manufacturer's instructions • Strict application of a quality control program • Careful verification that devices are operating properly • Correct loading of samples and precise programming of the requested analyses • Satisfactory resolution of minor problems with the operation of instruments
3. Prepare the biological samples.	• Satisfactory application of the preparation method in accordance with the nature of the sample and the types of analysis or examination • Appropriate handling of a batch of samples from different sources • Observance of the specific conditions for microbiology samples • Proper preparation of samples for wet examination and stained smears
4. Perform a microscopic examination of samples.	• Proper adjustment and use of microscopes • Careful examination of preparations: – wet mount – differential staining – using other staining techniques • Correct interpretation of observations
5. Inoculate the culture media.	• Rigorous consideration of the source and nature of the sample • Correct choice of culture media • Choice of environmental conditions for optimum growth • Proper inoculation of culture media • Isolation of microorganisms on the media so that individual bacterial colonies are obtained

Elements of the Competency	Performance Criteria
6. Identify the bacterial strain or species by using different techniques.	• Correct presumptive identification of bacterial strains by macroscopic and microscopic examinations, counts and other specific analyses • Correct identification of the bacterial strain or species, using biochemical techniques • Correct identification of the bacterial species, using immunological and molecular biology techniques
7. Perform tests related to antibiotic therapy.	• Correct choice of materials and laboratory instruments • Preparation of a bacterial suspension in accordance with the planned antibiotic therapy • Precise determination of the sensitivity of microorganisms to antibiotics
8. Detect and identify fungi, yeasts, parasite and viruses of clinical interest.	• Effective search and exact determination of the presence of the following in the samples: – fungi – yeasts – parasites – viruses • Safe handling of pathogenic microorganisms
9. Interpret the results.	• Appropriate processing of data • Verification of the analytical validation of the results • Verification of the biological validation of the results • Correct interpretation of the pathogenicity of microorganisms, taking into account the source of the sample • Strict application of the protocol for following up on the results, if necessary
10. Produce a report and communicate the results.	• Exact recording of the results • Affixing of a legible signature, initials or personal identification code • Choice and use of an appropriate means for reporting the results • Respect for confidentiality
11. Put away materials.	• Appropriate cleaning of equipment, instruments and work areas • Compliant storage of materials and samples • Compliance with regulations governing biomedical waste management

Code : 06DE

Objective *Standard*

Statement of the Competency	Achievement Context
Perform biomedical analyses in molecular biology.	• Based on a requisition or specific request from medical staff • Using a blood sample and, sometimes, other human biological samples • Based on instructions, protocols and standard operating procedures • In work areas dedicated to selective pre-amplification and selective post-amplification • Using products, materials and equipment such as a centrifuge, an electrophoresis system, a classic DNA amplification device (PCR), a quantitative DNA amplification device (PCR in real time), a sequencer, a photographic system, specialized software, a register and documentation • In close collaboration with other health professionals

	Performance Criteria for the Competency as a Whole
	• Compliance with workplace health and safety rules • Application of sterile techniques • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with International Organization for Standardization (ISO) standards • Clear concern for the quality of the work and efficiency

Program-Specific Component

Elements of the Competency	Performance Criteria
1. Organize the work.	• Correct interpretation of the requisition or specific request • Correct interpretation of instructions and protocols • Observance of storage periods and conditions for samples • Correct setting of analytical priorities • Careful functional set up of work areas (pre-and post PCR), taking into account the type of analysis to be performed
2. Prepare the materials and laboratory equipment.	• Appropriate preparation of solutions, reagents and laboratory instruments • Precise aliquoting of solutions and reagents • Storage of aliquots in accordance with the instructions or protocols • Maintenance performed in accordance with the manufacturer's instructions • Strict application of a quality control program • Careful verification that devices are operating properly • Correct loading of samples and precise programming of the requested analyses • Satisfactory resolution of minor problems with the operation of instruments
3. Prepare the biological samples.	• Strict application of protocols for preparing extraction plates • Careful extraction of DNA or RNA, taking into account their physicochemical characteristics • Satisfactory choice and application of DNA and RNA processing methods in accordance with the nature of the sample and the type of analysis to be performed • Careful preparation of samples for an analysis requiring immunoblotting or hybridization
4. Perform analyses in molecular biology.	• Correct choice and use of primers • Precise PCR amplification of the relevant DNA fragment • Exact quantitative amplification of the relevant DNA fragment • Precise determination of a DNA sequence • Correct detection and identification of molecules using immunoblotting or hybridization

Elements of the Competency	Performance Criteria
5. Interpret the results.	• Appropriate processing of data • Verification of the analytical validation of the results • Verification of the biological validation of the results • Strict application of the protocol for following up on the results, if necessary
6. Produce a report and communicate the results.	• Exact recording of the results • Affixing of a legible signature, initials or personal identification code • Choice and use of an appropriate means for reporting the results • Effective participation in the multidisciplinary consultation process, if applicable • Respect for confidentiality
7. Put away materials.	• Appropriate cleaning of equipment, instruments and work areas • Compliant storage of materials and samples • Compliance with regulations governing biomedical waste management

Code : 06DF

Objective — *Standard*

Statement of the Competency	Achievement Context
Perform analyses in transfusion medicine.	• Based on a requisition or specific request from medical staff • Using the recipient's pre-transfusion and post-transfusion blood samples • Using residual blood products transfused into a patient and blood products from a donor • Based on Québec's blood management system instructions and protocols • Using products, reagents, materials and equipment such as a serofuge, inverted microscope, water bath, incubator and red blood cell washer, equipment for carrying out tube and gel techniques, an automated agglutination detector and, lastly, traceability software and documentation • In collaboration with other health professionals

	Performance Criteria for the Competency as a Whole
	• Compliance with workplace health and safety rules • Application of sterile techniques • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with Canadian Society for Transfusion Medicine standards • Compliance with Canadian Standards Association (CSA) standards • Compliance with standardized transfusion practices • Clear concern for the quality of the work and efficiency

Program-Specific Component

Elements of the Competency	Performance Criteria
1. Organize the work.	• Correct interpretation of the requisition or specific request • Correct interpretation of instructions and protocols • Observance of storage periods and conditions for blood samples and products • Correct setting of analytical priorities
2. Prepare the materials, instruments and equipment.	• Appropriate preparation of solutions, reagents and laboratory instruments • Maintenance performed in accordance with the manufacturer's instructions • Strict application of a quality control program • Careful verification that devices are operating properly • Correct loading of samples and precise programming of the requested analyses • Satisfactory resolution of minor problems with the operation of instruments
3. Prepare the blood samples.	• Satisfactory application of the sample preparation method • Appropriate handling of a batch of samples in accordance with the type of analysis to be performed • Respect for the specific conditions for transfusion medicine samples
4. Perform routine analyses in transfusion medicine.	• Exact phenotyping of blood samples for the ABO and Rhesus groups • Exact phenotyping of blood samples for the other blood groups • Methodical search for irregular antibodies by using screening cells • Correct choice and use of an enhancement medium to search for irregular antibodies • Proper performance of the abbreviated compatibility test • Observance of the timeframes set by the institution for analysis in routine and emergency situations

Elements of the Competency	Performance Criteria
5. Perform additional analyses in transfusion medicine.	• Preliminary identification of antibodies present, using an antibody identification cell panel • Correct choice and use of an enhancement medium • Proper choice of exclusion cells to confirm the identity of the antibodies present • Correct phenotyping of the recipient in order to confirm agreement with the antibody identification • Correct interpretation of the autocontrol • Correct selection and use of positive and negative control during the phenotyping of the patient • Accurate phenotyping of blood products in order to select a compatible blood unit • Proper performance of the major crossmatch test
6. Perform specialized analyses in transfusion medicine.	• Proper execution of specialized analytical techniques, such as: – direct antiglobulin test – antibody titration – antibody elution – neutralization test – absorption or adsorption of antibodies – elimination of cold autoantibodies – elimination of warm autoantibodies • Proper execution of other specialized analysis techniques, if applicable
7. Interpret the results.	• Appropriate processing of data • Accurate reading of agglutination reactions • Verification of the analytical validation of the results • Verification of the biological validation of the results • Correlation between the analytical results and the agglutination pattern • Strict application of the protocol for following up on the results, if necessary
8. Produce a report and communicate the results.	• Exact recording of the results • Affixing of a legible signature, initials or personal identification code • Choice and use of an appropriate means for reporting the results • Respect for confidentiality

Program-Specific Component

Elements of the Competency	Performance Criteria
9. Put away materials.	• Appropriate cleaning of equipment, instruments and work areas • Compliant storage of materials and samples • Compliance with regulations governing biomedical waste management

Code: 06DG

Objective *Standard*

Statement of the Competency	Achievement Context
Prepare blood products for transfusion.	• Using labile and stable blood products • Based on a requisition or specific request from medical staff • Based on Québec's blood management system instructions and protocols • Using the patient's file • Using products, materials and equipment such as blood bank laboratory instruments used to prepare blood products as well as traceability software and documentation • In collaboration with other health professionals

	Performance Criteria for the Competency as a Whole
	• Compliance with workplace health and safety rules • Application of sterile techniques • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with Canadian Society for Transfusion Medicine standards • Compliance with Canadian Standards Association (CSA) standards • Compliance with standard transfusion practices • Compliance with International Society of Blood Transfusion labelling standards • Clear concern for the quality of the work and efficiency

Program-Specific Component

Elements of the Competency	Performance Criteria
1. Interpret the requisition or specific request.	• Specific knowledge of the: – type of requisition (urgent or routine) – demographic data – requested blood products (labile or stable) – quantities required – type of donation (autologous or allogeneic) • Correct interpretation of the specific request, if applicable
2. Select the blood products.	• In accordance with the requisition of specific request • Verification of the availability of the requested products • Correct selection of blood products, taking the following into account: – recipient's blood group – compatibility with the blood group of the person who is to receive the transfusion – patient's age – expiry date of the products – patient's transfusion history, if applicable • Selection made within the timeframe prescribed by the institution for the situation
3. Prepare blood products and transfusion material.	• Verification of the quality of the blood products: – presence of hemolysis – lipemic aspect – icteric product – presence of aggregations – presence of abnormal particles – presence of abnormal turbidity – abnormal colour or fading of the product – leaky container • Strict application of the methods recommended for preparing blood products, within the prescribed timeframes • Exact pooling of substances in order to complete the preparation of a blood product in accordance with a requisition • Compliant labelling of blood products • Appropriate choice of transfusion material • Diligent implementation of the institutional massive transfusion protocol, if necessary

Elements of the Competency	Performance Criteria
4. Manage the storage of blood products.	• Proper use of traceability software • Correct recording of blood products received • Compliant storage of blood products • Orderly classification of blood products • Proper cleaning of equipment, instruments and work areas • Traceability of a blood product throughout the transfusion process: – from the product number to the recipient – from the recipient to the product number
5. To maintain the supply of blood products in the organization responsible for blood management.	• Justified ordering of commonly used blood products in routine or emergency situations in accordance with the inventory • Ordering of requisitioned blood products, in special cases, such as: – CMV-negative; – HLA-compatible – irradiated products – washed red blood cells – specific phenotypes – blood from young donors – pediatric blood packs • Return of unused blood products in accordance with the prescribed condition and timeframes

Code: 06DH

Objective

Standard

Statement of the Competency	Achievement Context
Resolve transfusion problems.	• In routine or emergency situations • Based on a requisition or specific request from medical staff. • Based on Québec blood management system instructions and protocols • Based on the patient's medical file • Based on the results of the analytical validation and the biological validation • Using pretransfusion blood samples, post-transfusion blood samples, blood products and residual transfused blood products • Using products, materials, laboratory equipment, a transfusion service, traceability software and documentation • In collaboration with other health professionals

	Performance Criteria for the Competency as a Whole
	• Compliance with workplace health and safety rules • Application of sterile techniques • Compliance with the principles of Good Laboratory Practice (GLP) • Compliance with Canadian Society for Transfusion Medicine standards • Compliance with Canadian Standards Association (CSA) standards • Compliance with standard transfusion practices • Compliance with International Society of Blood Transfusion labelling standards • Clear concern for the quality of the work and efficiency

Program-Specific Component

Elements of the Competency	Performance Criteria
1. Examine an actual or potential transfusion problem by carrying out new analyses.	• Correct interpretation of the requisition or specific request • Careful performance of preliminary analyses. • Correct interpretation of the results of biomedical analyses • Precise identification of a transfusion problem like: – ABO discrepancy – grouping anomalies – hemolytic anemia of the newborn – autoimmune hemolytic anemia – positive results for and identification of irregular antibodies, etc. • Precise determination of the cause of a patient's adverse reaction to a transfusion • Precise determination of a problem related to blood products
2. Determine solutions and apply them.	• Careful selection and proper application of corrective measures to resolve the existing transfusion problem or prevent an adverse transfusion reaction • Validation of the selected solution with health practitioners, if necessary • Performance of recommended additional analyses depending on the nature of the existing or anticipated problem • Correct interpretation of the results of the additional analyses
3. Ensure transfusion follow up.	• Diligent initiation of the transfusion follow-up • Transfusion follow-up adapted to the problem on the technical level • Determination, declaration and evaluation of all adverse events • Appropriate follow-up with other professionals, if applicable

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

General Education Component Common to All Programs

English, Language of Instruction and Literature	Code: 4EA0

Objective ***Standard***

Statement of the Competency
Analyze and produce various forms of discourse.

Elements of the Competency	**Performance Criteria**
1. Identify the characteristics and functions of the components of literary texts.	• Accurate explanation of the denotation of words • Adequate recognition of the appropriate connotation of words • Accurate definition of the characteristics and function of each component
2. Determine the organization of facts and arguments of a given literary text.	• Clear and accurate recognition of the main idea and structure • Clear presentation of the strategies employed to develop an argument or thesis
3. Prepare ideas and strategies for a projected discourse.	• Appropriate identification of topics and ideas • Adequate gathering of pertinent information • Clear formulation of a thesis • Coherent ordering of supporting material
4. Formulate a discourse.	• Appropriate choice of tone and diction • Correct development of sentences • Clear and coherent development of paragraphs • Formulation of a 750-word discourse
5. Revise the discourse.	• Appropriate use of revision strategies • Appropriate revision of form and content

Learning Activities	
Discipline:	English, Language of Instruction and Literature
Weighting:	2-2-4 or 1-3-4
Credits:	2⅔

General Education Component Common to All Programs

English, Language of Instruction and Literature	Code: 4EA1

Objective ***Standard***

Statement of the Competency
Apply an analytical approach to literary genres.

Elements of the Competency	**Performance Criteria**
1. Distinguish genres of literary texts.	• Clear recognition of the formal characteristics of a literary genre
2. Recognize the use of literary conventions within a specific genre.	• Accurate recognition of the figurative communication of meaning • Adequate explanation of the effects of significant literary and rhetorical devices
3. Situate a work within its historical and literary period.	• Appropriate recognition of the relationship of a text to its period
4. Write a critical analysis of a literary genre.	• Selective use of appropriate terminology • Effective presentation of a 1000-word coherent response to a literary text
5. Revise the work.	• Appropriate use of revision strategies • Appropriate revision of form and content

Learning Activities	
Discipline:	English, Language of Instruction and Literature
Weighting:	2-2-3
Credits:	2⅓

English, Language of Instruction and Literature	Code: 4EA2

Objective ***Standard***

Statement of the Competency
Apply an analytical approach to a literary theme.

Elements of the Competency	**Performance Criteria**
1. Recognize the treatment of a theme within a literary text.	• Clear recognition of elements within the text, which define and reinforce a theme and its development • Adequate demonstration of the effects of significant literary and rhetorical devices
2. Situate a literary text within its cultural context.	• Appropriate recognition of a text as an expression of cultural context • Adequate demonstration of the effects of significant literary and rhetorical devices
3. Detect the value system inherent in a literary text.	• Appropriate identification of expression (explicit / implicit) of a value system in a text
4. Write an analysis on a literary theme.	• Selective use of appropriate terminology • Effective presentation of a 1000-word coherent response to a literary text
5. Revise the work.	• Appropriate use of revision strategies • Appropriate revision of form and content

Learning Activities	
Discipline:	English, Language of Instruction and Literature
Weighting:	2-2-3
Credits:	2⅓

General Education Component Specific to the Program

English, Language of Instruction and Literature	Code: 4EAP

Objective ***Standard***

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

Elements of the Competency	**Performance Criteria**
1. Identify the forms of discourse appropriate to given fields of study.	• Accurate recognition of specialized vocabulary and conventions • Accurate recognition of the characteristics of the form of discourse • Exploration of a variety of topics
2. Recognize the forms of discourse appropriate to given fields of study.	• Clear and accurate recognition of the main ideas and structure • Appropriate distinction between fact and argument
3. Formulate an oral or a written discourse.	• Examine ways to address and structure a given topic • Appropriate choice of tone and diction • Correctly developed sentences • Clearly and coherently developed paragraphs • Appropriate use of program-related communication strategies including media and technology • Formulation of a 1000-word discourse
4. Revise the work.	• Appropriate use of revision strategies • Appropriate revision of form and content

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

General Education Component Common to All Programs

Humanities	Code: 4HU0

Objective ***Standard***

Statement of the Competency
Apply a logical analytical process to how knowledge is organized and used.

Elements of the Competency	**Performance Criteria**
1. Recognize the basic elements of a field of knowledge.	• Appropriate description of the basic elements • Appropriate use of terminology relevant to a field of knowledge
2. Define the modes of organization and utilization of a field of knowledge.	• Adequate definition of the dimensions, limits, and uses of a field of knowledge
3. Situate a field of knowledge within its historical context.	• Accurate identification of the main components in the historical development of a field of knowledge • Accurate description of the effects of historical development and social context on the limits and uses of a field of knowledge
4. Organize the main components into coherent patterns.	• Coherent organization of the main components
5. Produce a synthesis of the main components.	• Appropriate analysis of the components • Coherent synthesis of the main components • Appropriate expression, including a significant individual written component, of an analysis of the context, importance and implications of the organization and uses of knowledge • Appropriate use of revision strategies • Appropriate revision of form and content

Learning Activities	
Discipline:	Humanities
Weighting:	3-1-3
Credits:	2⅓

Humanities	Code: 4HU1

Objective ***Standard***

Statement of the Competency
Apply a critical thought process to world views.

Elements of the Competency	**Performance Criteria**
1. Describe world views.	• Accurate description of a society or group with a distinctive world view • Appropriate use of terminology relevant to these societies or groups
2. Explain the major ideas, values, and implications associated with a given world view.	• Adequate explanation of the salient components of a world view
3. Organize the ideas, values and experiences of a world view into coherent patterns.	• Coherent organization of ideas about a world view • Appropriate expression, including a significant individual written component, of an analysis of the context, importance, and implications of world views
4. Compare world views.	• Comparative analysis of these world views • Appropriate inclusion of central elements, relationships, and organizational principles of the societies or groups in the analysis
5. Convey the ideas, attitudes, and experiences of the societies or groups studied.	• Coherent integration of the importance and implications of the world views for the given societies or groups • Appropriate use of revision strategies • Appropriate revision of form and content

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

General Education Component Common to All Programs

Humanities	Code: 4HUP

Objective ***Standard***

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

Elements of the Competency	**Performance Criteria**
1. Situate significant ethical issues in appropriate world views and fields of knowledge.	• Accurate recognition of the basic elements of ethical issues • Appropriate use of relevant terminology • Adequate identification of the main linkages with world views and fields of knowledge
2. Explain the major ideas, values, and social implication of ethical issues.	• Adequate description of the salient components of the issues
3. Organize the ethical questions and their implications into coherent patterns.	• Coherent organization of the ethical questions and their implications • Appropriate expression, including a significant individual written component, of an analysis of the context, importance and implications of the issues
4. Debate the ethical issues.	• Adequate development of substantiated argumentation including context and diverse points of view • Clear articulation of an individual point of view • Appropriate use of revision strategies • Appropriate revision of form and content

Learning Activities	
Discipline:	Humanities
Periods of instruction:	45
Credits:	2

French as a Second Language (Level I)	Code: 4SF0

Objective ***Standard***

Statement of the Competency
Apply basic concepts for communicating in standard French.

Elements of the Competency	**Performance Criteria**
1. Write and revise a simple text.	• Clear, coherent formulation of a text of about 250 words • Adequate development of the text: intention, topic, reader • Formulation of simple, well-constructed sentences • Use of adequate vocabulary for the task • Satisfactory application of the rules of grammar, in particular agreement in gender and number; regular verbs; verb tenses in the present, compound past and simple future • Satisfactory correction of errors in spelling or grammar • Appropriate use of revision strategies
2. Understand the meaning of a simple text.	• Accurate description of the general meaning and essential ideas of a 500-word text • Accurate identification of the difficulties in understanding the text • Appropriate use of reading techniques • Accurate identification of the main elements of the text
3. Convey a simple oral message.	• Clear and coherent formulation of an oral presentation of at least four minutes • Appropriate use of standard vocabulary • Clear and coherent statements
4. Understand the meaning of a simple oral message.	• Accurate identification of the general meaning and essential ideas of an oral message of at least four minutes • Accurate identification of the difficulties in understanding the message • Accurate description of the general meaning and essential ideas of the message

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

French as a Second Language (Level II)	Code: 4SF1

Objective ***Standard***

Statement of the Competency
Communicate in standard French with some ease.

Elements of the Competency	**Performance Criteria**
1. Write and revise a simple text.	• Writing of a text of about 350 words • Respect for grammar and spelling rules • Appropriate use of the main elements of the corpus • Clear, coherent formulation of sentences • Coherent organization of paragraphs • Appropriate use of revision strategies • Satisfactory correction of spelling and grammatical errors
2. Interpret a written text.	• Accurate identification of the main ideas and structure of a text of 700 to 1 000 words • Accurate identification of the main elements of the text • Accurate explanation of the meaning of the words of the text
3. Produce a planned oral text.	• Clear and coherent formulation of an oral presentation of at least five minutes • Appropriate use of standard vocabulary • Respect for the level of language and rules of grammar and pronunciation
4. Interpret a simple oral text.	• Accurate identification of the main elements of an oral text of at least five minutes • Accurate identification of the ideas and subjects dealt with in the text • Accurate explanation of the meaning of the words of the text

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

French as a Second Language (Level III)	Code: 4SF2

Objective ***Standard***

Statement of the Competency
Communicate with ease in standard French.

Elements of the Competency	**Performance Criteria**
1. Write a text of moderate complexity.	• Writing of a text of about 450 words • Respect for grammar and spelling rules • Adaptation to the intended audience • Appropriate use of the main elements of the corpus • Clear and coherent formulation of sentences, including at least three that are complex • Coherent organization of paragraphs
2. Revise and correct a text of moderate complexity.	• Appropriate use of revision strategies • Appropriate revision of the text
3. Comment on a written text of moderate complexity.	• Accurate identification of the main elements of a text of between 2 500 and 3 000 words • Accurate explanation of the meaning of the words of the text • Accurate identification of the main and secondary ideas, of facts and opinions • Accurate identification of what is implicit and what is explicit
4. Produce a planned oral text of moderate complexity.	• Clear and coherent formulation of an oral presentation of at least five minutes • Appropriate use of standard vocabulary • Respect for the level of language and rules of grammar and pronunciation • Adaptation to the intended audience • Appropriate sequencing of ideas

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

French as a Second Language (Level IV)	Code: 4SF3

Objective ***Standard***

Statement of the Competency
Explore a cultural and literary topic.

Elements of the Competency	**Performance Criteria**
1. Write a text on a cultural or literary topic.	• Clear and coherent formulation of a text of about 550 words • Respect for the topic • Respect for grammar and spelling rules • Adaptation to the intended audience • Appropriate use of the main elements of the corpus • Clear articulation of a personal point of view
2. Revise and correct a text on a cultural or literary topic.	• Appropriate use of revision strategies • Appropriate revision of the text
3. Analyze a cultural or literary text.	• Personal formulation of the main elements of the text • Identification of the main themes • Identification of clues that help situate the text in its sociocultural and historical context • Accurate identification of the values expressed • Accurate identification of the structure of the text • Clear articulation of a personal point of view

Learning Activities	
Discipline:	French as a Second Language
Weighting:	3-0-3
Credits:	2

French as a Second Language (Level I)	Code: 4SFP

Objective ***Standard***

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

Elements of the Competency	**Performance Criteria**
1. Write and revise a short text related to the student's field of study.	• Accurate identification of difficulties in writing • Appropriate use of writing techniques • Appropriate use of standard and specialized vocabulary • Clear and coherent formulation of the text • Appropriate use of revision strategies • Satisfactory correction of spelling and grammatical errors
2. Understand the meaning and characteristics of a text related to the student's field of study.	• Accurate identification of difficulties in understanding the text • Accurate identification of the characteristics of the text • Accurate identification of specialized vocabulary • Accurate identification of the main elements of the text • Accurate description of the general meaning and essential ideas of the text
3. Convey a simple oral message related to the student's field of study.	• Accurate identification of the difficulties in oral expression • Appropriate use of techniques of oral expression • Appropriate use of standard and specialized vocabulary • Intelligible expression of the message
4. Understand the meaning of a simple oral message related to the student's field of study.	• Accurate identification of difficulties in understanding the message • Accurate identification of the characteristics of the message • Accurate identification of specialized vocabulary • Accurate identification of the main elements of the message • Accurate description of the general meaning and essential ideas of the message

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

French as a Second Language (Level II)	Code: 4SFQ

Objective ***Standard***

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

Elements of the Competency	**Performance Criteria**
1. Write a text related to the student's field of study.	• Appropriate use of specialized vocabulary and of conventions specific to different types of texts • Respect for the level of language and rules of grammar and spelling • Clear and coherent formulation of the text • Appropriate use of writing techniques
2. Revise and correct a text on a topic related to the student's field of study.	• Appropriate use of revision strategies • Satisfactory correction of spelling and grammatical errors
3. Differentiate the types of texts specific to the student's field of study.	• Accurate identification of the formal characteristics of each of the main types of texts and the conventions used
4. Analyze texts representative of the student's field of study.	• Accurate identification of the main elements of the text • Accurate interpretation of specialized vocabulary • Accurate identification of the ideas and subjects dealt with • Appropriate use of reading and listening techniques

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

French, Second Language (Level III)	Code: 4SFR

Objective ***Standard***

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

Elements of the Competency	**Performance Criteria**
1. Produce a text on a topic related to the student's field of study.	• Respect for the topic • Appropriate use of specialized vocabulary and the conventions specific to different types of texts • Respect for the level of language and rules of grammar and spelling • Clear and coherent formulation of the text • Appropriate sequencing of ideas • Appropriate form for the content
2. Revise and correct a text on a topic related to the student's field of study.	• Appropriate use of revision strategies • Satisfactory correction of spelling and grammatical errors
3. Comment on texts specific to the student's field of study.	• Accurate identification of the formal characteristics of the main types of texts and the conventions used • Accurate explanation of the meaning of the words in the text • Accurate identification of the structure of the text • Accurate reformulation of the main and secondary ideas, of the facts and opinions • Accurate use of specialized vocabulary

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

French as a Second Language (Level IV)	Code: 4SFS

Objective ***Standard***

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

Elements of the Competency	**Performance Criteria**
1. Write a text on a topic related to the student's field of study.	• Respect for the topic • Appropriate use of specialized vocabulary and the conventions specific to different types of texts • Appropriate choice of the main elements of the corpus based on the type of text • Clear and coherent formulation of the text • Respect for the level of language and rules of grammar and spelling • Clear articulation of a personal point of view
2. Revise and correct a text on a topic related to the student's field of study.	• Appropriate use of revision strategies • Satisfactory correction of spelling and grammatical errors
3. Analyze a text related to the student's field of study.	• Precise differentiation of the formal characteristics of specific types of texts • Personal formulation of the main elements • Listing of the main themes • Accurate identification of the structure of the text • Identification of clues that help situate the text in its context • Clear articulation of a personal point of view • Accurate association of elements of the text with the topic

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

Physical Education	Code: 4EP0

Objective ***Standard***

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

Elements of the Competency	**Performance Criteria**
1. Establish the relationship between one's lifestyle habits and health.	• Proper use of documentation from scientific research or the media • Recognition of the influence of social and cultural factors on the practice of physical activity • Pertinent links made between one's lifestyle habits and the impact they have on health
2. Be physically active in a manner that promotes one's health.	• Respect for the rules specific to the physical activity practised • Respect for codes of ethics, safety rules and regulations when being physically active • Respect for one's abilities when practising physical activities
3. Recognize one's needs, abilities and motivational factors with respect to regular and sufficient physical activity.	• Appropriate use of strategies for the quantitative and qualitative evaluation of one's physical condition • Overall assessment of one's needs and abilities in terms of physical activity • Overall assessment of one's motivational factors with respect to being sufficiently active on a regular basis
4. Propose physical activities that promote one's health.	• Appropriate choice of physical activities according to one's needs, abilities and motivational factors • Use of clear reasoning to explain the choice of physical activity

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

Physical Education	Code: 4EP1

Objective ***Standard***

Statement of the Competency
Improve one's effectiveness when practising a physical activity.

Elements of the Competency	**Performance Criteria**
1. Plan an approach to improve one's effectiveness when practising a physical activity.	• Initial assessment of one's abilities and attitudes when practising a physical activity • Statement of one's expectations and needs with respect to the ability to practise the activity • Appropriate formulation of personal objectives • Appropriate choice of the means to achieve one's objectives • Use of clear reasoning to explain the choice of physical activity
2. Use a planned approach to improve one's effectiveness when practising a physical activity.	• Respect for the rules and regulations of the physical activity • Respect for codes of ethics, safety rules and regulations when being physically active • Appropriate use of strategies for the quantitative and qualitative evaluation of one's motor skills • Periodic assessment of one's abilities and attitudes when practising a physical activity • Meaningful interpretation of progress made and the difficulties encountered in the practice of physical activity • Pertinent, periodic and proper adjustments of one's objectives or means • Appreciable improvement in one's motor skills, techniques or complex strategies required by the physical activity

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

Physical Education	Code: 4EP2

Objective ***Standard***

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

Elements of the Competency	**Performance Criteria**
1. Plan a personal physical activity program.	• Mention of priorities according to one's needs, abilities, and motivational factors with respect to being sufficiently active on a regular basis • Proper and appropriate formulation of personal objectives • Appropriate choice of physical activity or activities to achieve personal objectives • Appropriate planning of the conditions for performing the physical activity or activities in personal program
2. Combine the elements of a regular and sufficient practice of physical activity as part of a healthy lifestyle.	• Respect for the rules and regulations of the physical activity • Respect for codes of ethics, safety rules and regulations when being physically active • Regular and sufficient practice of a physical activity while maintaining a balance between effectiveness and health-promoting factors
3. Manage a personal physical activity program.	• Appropriate choice of criteria for measuring the attainment of program objectives • Appropriate use of strategies for the quantitative and qualitative evaluation of one's physical activity • Periodic assessment of the time invested and activities practised during the program • Appropriate, periodic and proper adjustment of personal objectives or means used • Meaningful interpretation of the progress made and difficulties encountered in the practice of physical activities • Recognition of the effect of physical activity on one's lifestyle

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

Complementary General Education Component

Social Sciences	Code: 000V

Objective

Standard

Statement of the Competency	Achievement Context
Estimate the contribution of the social sciences to an understanding of contemporary issues.	• Working alone • In an essay of approximately 750 words on the contribution of the social sciences to an understanding of contemporary issues • Using documents and data from the field of social sciences

Elements of the Competency	Performance Criteria
1. Recognize the focus of one or more of the social sciences and their main approaches.	• Formulation of the focus specific to one or more of the social sciences • Description of the main approaches used in the social sciences
2. Identify some of the issues currently under study in the social sciences.	• Association of issues with the pertinent areas of research in the social sciences
3. Demonstrate the contribution of one or more of the social sciences to an understanding of contemporary issues.	• Presentation of contemporary issues by highlighting the interpretation of the social sciences • Illustration of the interaction between certain social changes and the contribution of the social sciences

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	Use the 300 or 400 series of codes (except codes 300 and 360) to link a course to objective 000V. Use code 305 for a multidisciplinary course. Codes 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.

Social Sciences	Code: 000W

Objective

Standard

Statement of the Competency	**Achievement Context**
Analyze one of the major problems of our time using one or more social scientific approaches.	• Working alone • In an essay of approximately 750 words on a topic related to human existence • Using reference materials from the field of social sciences

Elements of the Competency	**Performance Criteria**
1. Formulate a problem using one or more social scientific approaches.	• Presentation of the background to the problem • Use of appropriate concepts and language • Brief description of individual, collective, spatio-temporal and cultural aspects of the problem
2. Address an issue using one or more social scientific approaches.	• Clear formulation of an issue • Selection of pertinent reference materials • Brief description of historical, experimental and survey methods
3. Draw conclusions.	• Appropriate use of the selected method • Determination of appropriate evaluation criteria • Identification of strengths and weaknesses of the conclusions • Broadening of the issue analyzed

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	Use the 300 or 400 series of codes (except codes 300 and 360) to link a course to objective 000W. Use code 305 for a multidisciplinary course. Codes 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.

Science and Technology	Code: 000X

Objective

Standard

Statement of the Competency	**Achievement Context**
Explain the general nature of science and technology and some of the major contemporary scientific or technological issues.	• Working alone • Using a written commentary on a scientific discovery or technological development • In an essay of approximately 750 words

Elements of the Competency	**Performance Criteria**
1. Describe scientific thinking and the standard scientific method.	• Brief description of the essential characteristics of scientific thinking, including quantification and demonstration • Ordered list and brief description of the essential characteristics of the main steps in the standard scientific method
2. Demonstrate how science and technology are complementary.	• Definition of terms and description of the primary ways in which science and technology are interrelated: logical and temporal connections, and mutual contributions
3. Explain the context and the stages related to several scientific and technological discoveries.	• Pertinent and coherent explanation of the relationship between the determining contexts related to several scientific and technological discoveries • Listing of the main stages of scientific and technological discoveries
4. Deduce different consequences and questions resulting from certain recent scientific and technological developments.	• Brief description of important consequences (of different types) and the current major challenges resulting from several scientific and technological discoveries • Formulation of relevant questions and credibility of responses to the questions formulated

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	Use the 100 or 200 series of codes to link a course to objective 000X. Use code 105 for a multidisciplinary course. Codes 109, 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.

Science and Technology	000Y

Objective

Standard

Statement of the Competency	**Achievement Context**
Resolve a simple problem by applying the basic scientific method.	• Working alone or in groups • Applying the standard scientific method to a given, simple scientific and technological problem • Using common scientific instruments and reference materials (written or other)

Elements of the Competency	**Performance Criteria**
1. Describe the main steps of the standard scientific method.	• Ordered list and brief description of the characteristics of the steps of the standard scientific method
2. Formulate a hypothesis designed to solve a simple scientific and technological problem.	• Clear, precise description of the problem • Observance of the principles for formulating a hypothesis (observable and measurable nature of data, credibility, etc.)
3. Verify a hypothesis by applying the fundamental principles of the basic experimental method.	• Pertinence, reliability and validity of the experimental method used • Observance of established experimental method • Appropriate choice and use of instruments • Clear, satisfactory presentation of results • Validity of the connections established between the hypothesis, the verification and the conclusion

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	Use the 100 or 200 series of codes to link a course to objective 000Y. Use code 105 for a multidisciplinary course. Codes 109, 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.

Modern Language	Code: 000Z

Objective

Standard

Statement of the Competency	Achievement Context
Communicate with limited skill in a modern language.	• For modern Latin-alphabet languages: – during a conversation consisting of at least eight lines of dialogue – in a written text consisting of at least eight sentences • For modern non–Latin-alphabet languages: – during a conversation consisting of at least six lines of dialogue – in a written text consisting of at least six sentences • Based on learning situations on familiar themes • Using reference materials

Elements of the Competency	Performance Criteria
1. Understand the meaning of an oral message.	• Accurate identification of words and idiomatic expressions • Clear recognition of the general meaning of simple messages • Logical connection between the various elements of the message
2. Understand the meaning of a written message.	• Accurate identification of words and idiomatic expressions • Clear recognition of the general meaning of simple messages • Logical connection between the various elements of the message
3. Express a simple message orally.	• Appropriate use of language structures in main and coordinate clauses • Appropriate application of grammar rules • Use of verbs in the present indicative • Appropriate use of basic vocabulary and idiomatic expressions • Clear pronunciation • Coherent sequencing of simple sentences • Spontaneous and coherent sequencing of sentences in a conversation
4. Write a text on a given subject.	• Appropriate use of language structures in main and coordinate clauses • Appropriate application of basic grammar rules • Use of verbs in the present indicative • Appropriate use of basic vocabulary and idiomatic expressions • Coherent sequencing of simple sentences • Acceptable application of graphic rules for writing systems that do not use the Latin alphabet

Complementary General Education Component

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	The acquisition of a modern language requires an awareness of the culture of its native speakers. “Limited skill” refers to the limited use of language structures, grammar and vocabulary. This limitation varies depending on the complexity of the modern language. Use the 600 series of codes to link a course to objective 000Z, with the exception of codes 601, 602, 603 and 604.

Modern Language	Code: 0010

Objective

Standard

Statement of the Competency	**Achievement Context**
Communicate on familiar topics in a modern language.	• During a conversation that includes at least 15 lines of dialogue • In a written text consisting of at least 20 sentences for Latin-alphabet languages • In a written text consisting of at least 10 sentences for non–Latin-alphabet languages • Based on: - common situations in everyday life - simple topics from everyday life • Using reference materials

Elements of the Competency	**Performance Criteria**
1. Understand the meaning of an oral message.	• Accurate identification of words and idiomatic expressions • Clear recognition of the general meaning and essential ideas of messages of average complexity • Logical connection between the various elements of the message
2. Understand the meaning of a written message.	• Accurate identification of words and idiomatic expressions • Clear recognition of the general meaning and essential ideas of messages of average complexity • Logical connection between the various elements of the message
3. Express a simple message orally, using sentences of average complexity.	• Appropriate use of language structures in main or subordinate clauses • Appropriate application of grammar rules • Use of verbs in the present indicative • Appropriate use of enriched basic vocabulary and idiomatic expressions • Clear pronunciation • Coherent sequencing of sentences • Dialogue
4. Write a text on a given subject, using sentences of average complexity.	• Appropriate use of language structures in main or subordinate clauses • Appropriate application of grammar rules • Use of verbs in the present and past indicative • Appropriate use of enriched basic vocabulary and idiomatic expressions • Coherent sequencing of sentences of average complexity • Acceptable application of graphic rules for writing systems that do not use the Latin alphabet

Complementary General Education Component

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	The acquisition of a modern language requires an awareness of the culture of its native speakers. Use the 600 series of codes to link a course to objective 0010, with the exception of codes 601, 602, 603 and 604.

Modern Language	Code: 0067

Objective

Standard

Statement of the Competency	Achievement Context
Communicate with relative ease in a modern language.	• Working alone • During a conversation consisting of at least 20 lines of dialogue • In a written text of medium length (at least 25 sentences for Latin-alphabet languages and 15 sentences for other languages) • Given documents of a sociocultural nature • Using reference materials for the written text

Elements of the Competency	Performance Criteria
1. Understand the meaning of an oral message in everyday language.	• Accurate explanation of the general meaning and essential ideas of the message • Clear identification of structural elements of the language
2. Understand the meaning of a text of average complexity.	• Accurate explanation of the general meaning and essential ideas of the text • Clear identification of structural elements of the language
3. Have a conversation on a subject.	• Appropriate use of the structural elements of the language according to the message to be expressed • Appropriate use of everyday vocabulary • Accurate pronunciation and intonation • Normal flow in a conversation in everyday language • Coherence of the message expressed • Pertinent responses to questions
4. Write a text of average complexity.	• Appropriate use of the structural elements of the language according to the text to be written • Accurate vocabulary • Coherence of the text as a whole • Observance of presentation and writing rules applicable to the text

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	The acquisition of a modern language requires an awareness of the culture of its native speakers. Use the 600 series of codes to link a course to objective 0067, with the exception of codes 601, 602, 603 and 604.

Mathematics Literacy and Computer Science	Code: 0011

Objective

Standard

Statement of the Competency	**Achievement Context**
Recognize the role of mathematics or computer science in contemporary society.	• Working alone • In an essay of approximately 750 words • Using different personally selected concrete examples

Elements of the Competency	**Performance Criteria**
1. Demonstrate the acquisition of basic general knowledge of mathematics or computer science.	• Identification of basic notions and concepts • Identification of the main branches of mathematics or computer science • Appropriate use of terminology
2. Describe the evolution of mathematics or computer science.	• Descriptive summary of several major phases
3. Recognize the contribution of mathematics or computer science to the development of other areas of knowledge.	• Demonstration of the existence of important contributions, using concrete examples
4. Illustrate the diversity of mathematical or computer science applications.	• Presentation of a range of applications in various areas of human activity, using concrete examples
5. Evaluate the impact of mathematics or computer science on individuals and organizations.	• Identification of several major influences • Explanation of the way in which mathematics or computer science have changed certain human and organizational realities • Recognition of the advantages and disadvantages of these influences

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	Only the following codes can be used to link a course to objective 0011: 105, 201, 204, 420. Use code 204 for a multidisciplinary course. Codes 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.

Mathematics Literacy and Computer Science	Code: 0012

Objective

Standard

Statement of the Competency	**Achievement Context**
Use various mathematical or computer science concepts, procedures and tools for common tasks.	• Working alone • While carrying out a task or solving a problem based on everyday needs • Using familiar tools and reference materials

Elements of the Competency	**Performance Criteria**
1. Demonstrate the acquisition of basic functional knowledge in mathematics or computer science.	• Brief definition of concepts • Correct execution of basic operations • Appropriate use of terminology
2. Select mathematical or computing tools and procedures on the basis of specific needs.	• Listing of numerous possibilities available through the use of mathematical and computing tools and procedures • Analysis of concrete situations and recognition of the usefulness of mathematical or computing tools and procedures • Appropriate choice according to needs
3. Use mathematical or computing tools and procedures to carry out tasks and solve problems.	• Use of a planned and methodical process • Correct use of tools and procedures • Satisfactory results, given the context • Appropriate use of terminology specific to a tool or procedure
4. Interpret the quantitative data or results obtained using mathematical or computing tools and procedures.	• Accurate interpretation, given the context • Clear, precise formulation of the interpretation

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	Only the following codes can be used to link a course to objective 0012: 105, 201, 204 and 420. Use code 204 for a multidisciplinary course. Codes 340 and 345 may be used, provided the courses are not related to the objectives of common or specific general education.

Complementary General Education Component

Art and Aesthetics	Code: 0013

Objective

Standard

Statement of the Competency	**Achievement Context**
Consider various forms of art produced according to aesthetic practices.	• Working alone • Given a specified work of art • In a written commentary of approximately 750 words

Elements of the Competency	**Performance Criteria**
1. Develop an appreciation for the dynamics of the imagination in art.	• Precise explanation of a creative process connected to the construction of an imaginary universe
2. Describe art movements.	• Descriptive list of the main characteristics of three art movements from different eras, including a modern movement
3. Give a commentary on a work of art.	• Coherent organization of observations, including identification of four fundamental elements of form and structure related to the language used as well as a reasoned description of the meaning of the work of art

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	Use the 500 series of codes (except 502) to link a course to objective 0013. Use code 504 for a multidisciplinary course. Codes 340, 345, 601, 602, 603 and 604 may be used, provided the courses are not related to the objectives of common or specific general education.

Art and Aesthetics	Code: 0014

Objective

Standard

Statement of the Competency	Achievement Context
Produce a work of art.	• Working alone • During a practical exercise • In the context of creating or interpreting a work of art • Using the basic elements of the language and techniques specific to the medium selected

Elements of the Competency	Performance Criteria
1. Recognize the primary forms of expression of an artistic medium.	• Identification of specific features: originality, essential qualities, means of communication, styles, genres
2. Use the medium.	• Personal, coherent use of elements of language • Satisfactory application of artistic techniques • Compliance with the requirements of the method of production

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	Use the 500 series of codes to link a course to objective 0014, with the exception of code 502. Use code 504 for a multidisciplinary course. Codes 340, 345, 601, 602, 603 and 604 may be used, provided the courses are not related to the objectives of common or specific general education.

Contemporary Issues	Code: 021L

Objective

Standard

Statement of the Competency	**Achievement Context**
Consider contemporary issues from a transdisciplinary perspective.	• Individually or in groups • Drawing on different fields of knowledge • Using documents and data from various disciplines

Elements of the Competency	**Performance Criteria**
1. Identify major contemporary issues.	• Exploration of various contemporary issues • Description of the main perspectives concerning these issues • Clear formulation of objects to study related to these issues
2. Recognize the specific role of several disciplines in the understanding of an issue.	• Identification of some of the theories used in analyzing the issue • Clear description of the concepts and methods used
3. Demonstrate the contribution of several disciplines to the understanding of an issue.	• Clear formulation of the perspectives of the issue • Precise description of the main contributions of the disciplines • Pertinent explanation of the interaction among various disciplines • Appropriate use of language and concepts from the disciplines

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	This objective lends itself to teaching by one or more teachers. Use code 365 to link a course to objective 021L in order to maintain the transdisciplinary nature of the competency.

Contemporary Issues	Code: 021M

Objective

Standard

Statement of the Competency	**Achievement Context**
Explore a contemporary issue from a transdisciplinary perspective.	• Individually or in groups • Drawing on different fields of knowledge • Using documents and data from various disciplines

Elements of the Competency	**Performance Criteria**
1. Present a research problem.	• Justification of the choice of research problem • Brief description of the main issues involved in the problem • Clear formulation of the main dimensions of the problem • Appropriate use of language and concepts from the disciplines • Clear formulation of the research question
2. Analyze the research problem.	• Relevant description of a research approach or method • Appropriate selection of research data • Proper application of the approach or method used • Appropriate use of an analytical framework
3. Propose solutions.	• Clear description of the main contributions from the disciplines • Pertinent explanation of the interaction among various disciplines • Justification of solutions proposed • Assessment of the strengths and weaknesses of the proposed solutions

Learning Activities	
Periods of instruction:	45
Credits:	2
Note:	This objective lends itself to teaching by one or more teachers. Use code 365 to link a course to objective 021M in order to maintain the transdisciplinary nature of the competency.

Additional Information

Vocabulary Used in Technical Programs

Program

A program is an integrated set of learning activities leading to the achievement of education objectives based on set standards (*College Education Regulations,* s. 1). All college programs include a general education component common to all programs; a general education component adapted to the specific program; a complementary general education component; and a program-specific component (*College Education Regulations,* s. 6).

Competency

In the program-specific component of a technical program, a competency is defined as the ability to act, succeed and evolve in order to adequately perform tasks or work-related activities, based on an organized body of knowledge (including elements of knowledge, skills in a variety of fields, perceptions, attitudes, etc.) (*Élaboration des programmes d'études techniques*, *Cadre général – Cadre technique 2002*, p. 15).

Objective

An objective is defined as the competency, skills or knowledge to be acquired or mastered (*College Education Regulations,* s. 1). Each objective is formulated in terms of a competency and includes a statement of the competency and its elements. The achievement of objectives and respect for the standards ensure the acquisition or mastery of the college-level general education competencies.

Statement of the Competency

In the program-specific component of a technical program, the statement of the competency is the result of an analysis of the needs of the job situation, the general goals of technical training and (in some cases) other factors. In the general education components, it is the result of an analysis of the needs of general education.

Elements of the Competency

In the program-specific component of a technical program, the elements of the competency include only what is necessary in order to understand and master the competency. They refer to the major steps involved in performing a task or to the main components of the competency.

In the general education components, the elements of an objective, formulated in terms of a competency, specify the main aspects of the competency.

Standard

A standard is defined as the level of performance at which an objective is considered to be achieved (*College Education Regulations,* s. 1). In the program-specific component of a technical program, it is composed of an achievement context and performance criteria.

Performance Criteria

In the program-specific component of a technical program, the performance criteria define requirements by which to judge the attainment of each element of the competency and consequently of the competency itself. The performance criteria are based on the requirements at entry level on the job market. Each element of the competency requires at least one performance criterion.

In the general education components, the performance criteria define the requirements for recognition of the attainment of the standard.

In both components, all the criteria must be respected for the objective to be recognized as having been attained.

Achievement Context

In the program-specific 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.

Learning Activities

In the program-specific component of a technical program, the learning activities are classes (or 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.

In the general education components, 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 number of contact hours, the number of credits and any details deemed essential.

Harmonization

The Ministère de l'Éducation, de l'Enseignement supérieur et de la Recherche harmonizes its vocational and technical programs by establishing similarities and continuity between secondary- and college-level programs within a particular sector or between sectors, in order to avoid overlap in program offerings, recognize prior learning and facilitate the students' progress.

Harmonization establishes consistency between training programs and is especially important in ensuring that the tasks of a trade or occupation are clearly identified and described. Harmonization makes it possible to identify tasks requiring competencies that are common to more than one program. Even if there are no common competencies, training programs are still harmonized.

Harmonization is said to be "inter-level" when it focuses on training programs at different levels, "intra-level" when it focuses on programs within the same educational level, and "inter-sector" when carried out between programs in various sectors.

An important aspect of harmonization is that it allows the common features of competencies to be identified and updated as needed. Common competencies are those that are shared by more than one program; once acquired in one program, they can be recognized as having been acquired in another. Competencies with exactly the same statement and elements are said to be identical. Common competencies that are not identical but have enough similarities to be of equal value are said to be equivalent.

Harmonization of the *Biomedical Laboratory Technology* program has resulted in identifying competencies that are shared with *Laboratory Technology, specialization streams A Biotechnology and B Analytical Chemistry.* Detailed information on the harmonization of this program and its results are presented in the document entitled *Table of harmonized competencies, Biomedical Laboratory Technology.*

Occupational Health and Safety Hazards

This section expands on the risks associated with the competencies in the *Biomedical Laboratory Technology* program.

The table below, “Sources and risk levels for each competency,” links competencies with the six sources of risk listed in the following typology. It also indicates whether the risk level is high or low. These levels of risk are provided for information purposes only since they vary depending on the operations carried out and the achievement context. The table serves as a guide for teachers to planning progressive learning activities and a way of organizing their teaching in compliance with occupational health and safety in the workplace.

Typology of occupational health and safety in the workplace with a list of dangers and hazardous situations:

- Chemical hazards or dangers:
  - Form of substance (solid, liquid, aerosol, gas, etc.) and exposure (inhalation, absorption through the skin, ingestion, etc.).

- Physical hazards or dangers:
  - Electrical hazards
  - Thermal hazards
  - Noise
  - Vibration
  - Other physical hazards

- Biological hazards or dangers:
  - Form of substance (dust, mist, fluid, etc.) and exposure (inhalation, absorption through the skin, ingestion, cuts, etc.).

- Ergonomic hazards or dangers:
  - Constrained postures
  - Excessive effort
  - Repetitive movements

- Safety hazards or dangers:
  - Hazards related to general mechanical phenomena
  - Hazards related to moving parts, tools or vehicles
  - Risk of falling (workers and objects)
  - Hazards linked to confined spaces
  - Fire or explosion hazards
  - Violence in the workplace

- Psychosocial hazards or dangers:
  - Factors associated with the nature of the work
  - Factors related to the organization of the work
  - Social factors

TABLE: SOURCES AND RISK LEVELS FOR EACH COMPETENCY							
COMPETENCY NUMBER	***BIOMEDICAL LABORATORY TECHNOLOOGY***	**Sources of risk**					
		Chemical hazards or dangers	Physical hazards or dangers	Biological hazards or dangers	Ergonomic hazards or dangers	Safety hazards or dangers	Psychosocial hazards or dangers
	STATEMENT OF THE COMPETENCY	1	2	3	4	5	6
1	Analyze the profession and training.						
2	Carry out quality control activities in a clinical setting.	○	○	○			○
3	Describe the anatomical and physiological characteristics of biological samples.						
4	Perform pre-analytical procedures to prepare samples of body fluids for biomedical analyses.	○	○	○	○	○	
5	Establish professional relationships in biomedical analysis.						○
6	Procure biological samples from a client.	○	○	○	○	○	○
7	Perform basic quantitative analyses of biomolecules in a clinical setting.	○	○	○	○		
8	Perform specialized quantitative analyses of biomolecules in a clinical setting.	○	○	○	○		
9	Carry out professional activities associated with pharmacology.	○			○		○
10	Identify microorganisms.	○	○	○	○		
11	Produce histological sections for pathological examinations.	○	○	○	○	●	
12	Conduct a biological validation of the results of biomedical analyses.						○
13	Perform biomedical analyses in hemostasis.	○	○	○	○		
14	Perform biomedical analyses in hematology.	○	○	○	○		
15	Perform biomedical analyses in biochemistry.	○	○	○	○		
16	Perform biomedical analyses in microbiology.	○	○	○	○		
17	Perform biomedical analyses in molecular biology.	○	○	○	○		
18	Perform analyses in transfusion medicine.	○	○	○	○		
19	Prepare blood products for transfusion.	○	○	○	○		○
20	Resolve transfusion problems.						○

Risk levels

Risk levels are indicated according their frequency, duration or intensity, and not according to the severity of their effects on personal health and safety.

Low risk: ○ High risk: ●

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