Biomedical Laboratory Technology (140.C0)

Sector 19 – Health Services

College Education Program

Québec

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Ministère de l'Éducation et de l'Enseignement supérieur

Coordination
Louise Brunelle
Coordinator—Health Services Sector
Direction des programmes de formation technique
Direction générale de l'enseignement collégial
Ministère de l'Éducation et de l'Enseignement supérieur

Design and Development
Joël Gagné, Ph. D.
Teacher and coordinator
Département de technologie d'analyses biomédicales
Cégep de Rosemont

Diane Mastrianni
Program development consultant
Training consultant

With the cooperation of:
Johanne Brown, T. M.
Retired teacher
Cégep de Rosemont

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English Version
Direction des services à la communauté anglophone—Services langagiers
Secteur des services aux anglophones, aux autochtones et à la diversité culturelle et relations extérieures
Ministère de l'Éducation et de l'Enseignement supérieur

Technical Editing
Karen Gabriele
Teacher and Program Coordinator
Biomedical Laboratory Technology
Dawson College

For additional information, contact:
General Information
Direction des communications
Ministère de l'Éducation et de l'Enseignement supérieur
1035, rue De La Chevrotière, 28e étage
Québec (Québec) G1R 5A5
Telephone: 418-643-7095
Toll-free: 1-866-747-6626

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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:

-

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

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 the

The *Biomedical Laboratory Technology* Program

The *Biomedical Laboratory Technology* program was designed in accordance with the framework for developing technical programs. This approach in

The following is a description of the aims of the p

- 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
    -

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:
    - 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
    -

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.

General Education Component Common to All Programs

Complementary General Education Component

Analyze the profession and training.

Carry out quality control activities in a clinical setting.

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 •

Program-Specific Component

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) regulation2024( )]TJ ET Q 0.121094 0.284912 0.488037 rg q 8.33 pr(r)-13.80T /R17 10.7461 Tf 0.999341 0 0 1 62.4 409.4 Tm ( )Tj pr271706 TL T*[(p)-1.35771(r)-1.41517(271706 TL T*[(p)-1.35776

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

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

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 institutists itiooares

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

Program-Specific Component

Elements of the Competency	Performance Criteria

Code: 06D4

Objective

Standard

Statement of the Competency

Perform basic quantitative analyses of biomolecules in a clinical setting.

Achievement Context

- 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
-

Program-Specific Component

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

Elements of the Competency	Performance Criteria
6. Perform a qualitative and quantitative assay of biomolecules using immunological techniques.	•

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**

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 spec

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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

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

Code : 06DA

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

Elements of the Competency	Performance Criteria
8. Perform biomedical analyses at the point of care, such as: – bleeding time –	

Code : 06DB

Objective *Standard*

Statement of the Competency	Achievement Context
Perform biomedical analyses in hematology.	

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 54771(c)-7.81669(i)-0.943445(f)-6.87324(i)-0s

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 –	

Code : 06DD

Objective	*Standard*
Statement of the Competency	**Achievement Context**
Perform biomedical analyses in microbiology.	•

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

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

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 q (·)Tj /R17 9.6942 Tf 4.44258 0

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 mi76.s1(t)-6.87771( )-6.87324(

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 •

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

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**

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 pre 7(r)10.9706( )-19uc4

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

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

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 respons445( )-6.87173(a)-1.35 s literate ad

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.	

Humanities	Code: 4HU1

Objective	*Standard*
Statement of the Competency	

General Education Component Common to All Programs

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 •

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 •

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(o)-1.35771(f)-6.8717373666666666666666666666666666666666666666666666666666666666

General Education Component Specific to the Program

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 •

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 •

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 •

Physical Education	Code: 4EP2

Complementary General Education Component

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.	•

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.)

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	

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.

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 •

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**

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

Complementary General Education Component

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

Complementary General Education Component

Code: 021M

Standard

Achievement Context

- Individually or in groups
- Drawing on different fields of knowledge
- Using documents and data from various disciplines

Performance Criteria

- 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

[redacted]

- 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
- Clear description of the main contributions from the disciplines
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Additional Information

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.

Occupational Health and Safety Hazards

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