

We acknowledge and respect that we are gathered on the traditional lands of the Anishnaabe People of Turtle Island and proudly recognize our local host Atikameksheng Anishnawbek. We also recognize the contributions of Wahnapiatae First Nation and the Metis Nation of Ontario.

Course Title	Anatomy & Physiology I				
Course Code:	BIO1107	Credit Value:	3	Credit Hours:	42
Programs:	APDC Anatomy And Physiology Dual Credit DHYG Dental Hygiene MASG Massage Therapy PARA Paramedic				
Equivalencies		Prerequisites		Corequisites	

This course may be delivered in a variety of different formats: 100% in-class, 100% online (or a blend of both), videoconferencing, distributed learning or off-campus. Please confirm with your faculty member which format will be used for your section of this course.

General Education Course: ☐

Eligible for PLAR: ☒

Degree Breadth Course: ☐

Experiential Learning: ☐

Research Intensive Course Designation: ☐

COURSE DESCRIPTION

In this course, students will begin their comprehensive study of the anatomy and physiology of the human body. Topics include body tissue organization; homeostasis; cytology; histology; and an examination of the integumentary, skeletal, muscular, nervous systems and special senses. Upon completion, students will be able to apply fundamental concepts of anatomy and physiology in the analysis of the complex interactions between multiple body systems. Students may examine anatomical alterations to tissues during specific disease states, solely for the purpose of reinforcing specific concepts as they relate to the non-diseased state.

Date: May 28, 2026

Approved by: 

LESLEY LALONDE
Chair, Health Sciences And Emergency Services

Effective: Fall 2026, Winter 2027, Spring 2027

RELATIONSHIP TO PROGRAM VOCATIONAL LEARNING OUTCOMES

PROGRAM LEVEL	
This course contributes to your program by allowing you to demonstrate the following vocational learning outcomes:	
Program(s)	Vocational Learning Outcomes
Dental Hygiene	Ministry Standards 1. Practice in a professional and competent manner within the defined scope of practice and consistent with current regulations and standards of practice.
Massage Therapy	Ministry Standards 1. Collect and assess clients' information to determine their state of health and the treatment goals. 2. Develop a plan of care according to the client's condition and the treatment goals. 3. Implement the plan of care according to the client's condition and the treatment goals.
Paramedic	Accreditation Standards 1. The program supports the students' educational interests and protects their rights. 2. The program's resources are adequate to support student learning to the level required to meet the objectives. Ministry Standards 1. Communicate and interact effectively and appropriately with patients and others. 2. Assess patients using relevant theory and practices and in compliance with current legislation, regulations, standards, and best practice guidelines.

COURSE CURRICULUM**Topics/Concepts Covered in This Course**

- Language of Anatomy
- Homeostasis
- Basic Biochemistry
- The Cell
- Body Tissues
- Integumentary System
- Skeletal System and Articulations
- Muscles and Muscle Physiology
- Nervous System
- Special Senses

COURSE LEVEL: Learning Outcomes and Objectives		
To earn credit for this course, you must reliably demonstrate your ability to:		
Learning Outcome	Objectives	Competency Profile
1. Describe the major themes of anatomy and physiology to include: relationship between anatomy and physiology, levels of organization, homeostasis, and anatomical terminology.	1.1 Explain how anatomy and physiology are related. 1.2 Name the levels of structural organization that make up the human body and explain how they are related. 1.3 Name the organ systems of the body and briefly state the major functions of each system. 1.4 Apply the concepts of positive and negative feedback in explaining how the body maintains homeostasis. 1.5 Demonstrate proper anatomical position. 1.6 Select proper anatomical terminology to describe body directions, surfaces, and body planes. 1.7 Locate the major body cavities and list the chief organs in each cavity.	MASG - 1.1h1 (A)
2. Describe the basic chemistry and biochemistry associated with metabolic processes, anatomical structure, and physiology.	2.1 Explain the significance of water in the human body. 2.2 Interpret the role of specific electrolytes in the human body. 2.3 Predict the effects of acids and bases on body fluid pH. 2.4 Identify the healthy range for serum pH and the importance of maintaining this range. 2.5 Define metabolism and its two subdivisions. 2.6 Compare and contrast carbohydrates, lipids, proteins and nucleic acids in terms of their building blocks, structures and functions in the body. 2.7 Differentiate the functions of proteins and enzymes.	

Learning Outcome	Objectives	Competency Profile
	2.8 Compare and contrast the structures and functions of DNA and RNA. 2.9 Describe the structure, production, and function of ATP.	
3. Describe the structure of the cell and outline the function of the plasma membrane and organelles.	3.1 Identify the major structural and functional components of a cell. 3.2 Describe the structure and specializations of the plasma membrane. 3.3 Describe the various mechanisms for transporting material through the plasma membrane. 3.4 Apply the concept of tonicity to water shifts between intra- and extracellular fluid. 3.5 Summarize the functions of the major organelles in a cell. 3.6 List the stages of the cell cycle. 3.7 Describe the processes of DNA replication, transcription, and translation	
4. Describe the functions of the various tissue types and membranes found throughout the body.	4.1 Name the four primary classes into which all adult tissues are classified. 4.2 Classify eight types of epithelial tissue and distinguish them from each other based on their locations and functions in the body. 4.3 Describe the typical anatomy of a gland. 4.4 Discuss the types of cells and fibers found in connective tissue. 4.5 Differentiate between the types of connective tissue according to their structure, function, and location. 4.6 Describe the roles of different types of membranes in the body. 4.7 Explain the process of tissue repair.	
5. Describe the structure and function of the integumentary system.	5.1 Explain the key features of the epidermis, dermis, and subcutaneous tissue.	MASG - 1.1h1 (A), 2c1,2, 3.1c1,2 Appendix

Learning Outcome	Objectives	Competency Profile
	5.2 Describe the biological functions of the skin. 5.3 Describe the composition and function of hair and nails. 5.4 Compare the locations and secretions produced by eccrine and apocrine sweat glands. 5.5 Classify burns based on the presenting features of damaged tissue.	2abcdg, 5d, 7f (all A)
6. Describe the structure and function of cartilage and bone tissue.	6.1 State several functions of the skeletal system. 6.2 Compare the histologies of the two types of bone tissue. 6.3 Describe the gross anatomy of a long bone. 6.4 Describe the location, structure, and function of the various types of bone marrow. 6.5 Explain how bones regulate blood calcium and phosphate levels. 6.6 Describe the effects of hormones on bone tissue.	MASG - 1.1h1 (A), 2c1,2, 3.1c1,2 Appendix 5ae, 7f (all A)
7. Locate the bones and briefly describe the major features of the human skeleton.	7.1 State the approximate number of bones in the human skeleton. 7.2 Distinguish the bones of the axial and appendicular skeleton. 7.3 Identify important landmarks from axial and appendicular bones	MASG - 1.1h1 (A), 2c1,2, 3.1c1,2 Appendix 5a (all A)
8. Describe the various types of joints in the body and discuss the structure and function of synovial joints.	8.1 Relate the structures of joints to their functions. 8.2 Contrast the structures of the six types of synovial joints. 8.3 List the anatomical components of synovial joints and their properties. 8.4 Analyze the structure of the knee joint and how it affects stability. 8.5 Differentiate between fibrous, cartilaginous, and synovial joints.	MASG - 1.1h1 (A), 2c1,2, 3.1c1,2 Appendix 5e (all A)
9. Describe the location and function of specific types of muscle tissue and explain the mechanisms of muscle contraction.	9.1 Contrast the three types of muscle according to their locations, structural properties, and physiological roles.	MASG - 1.1h1 (A), 2c1,2, 3.1c1,2 Appendix 5b (all A)

Learning Outcome	Objectives	Competency Profile
	9.2 Describe the structural organization of a skeletal muscle. 9.3 Outline the relationship between the muscular and nervous systems. 9.4 Describe the neuromuscular junction and its components. 9.5 Differentiate the roles of sodium, potassium, calcium and neurotransmitters in muscle contraction. 9.6 Outline the process of muscle contraction and relaxation using the sliding filament theory. 9.7 Explain how threshold stimulus and the all-or-none principle relate to muscle contraction. 9.8 Explain the relationship between a muscle's origin, insertion and action. 9.9 Identify the muscles which operate the jaw, neck, shoulder, elbow, wrist, hip, knee and ankle joints. 9.10 Describe the structure and function of the diaphragm.	
10. Describe the structure and function of nervous tissue.	10.1 Outline the structures of a neuron that contribute to impulse conduction. 10.2 Describe the roles of the various cell types that support neurons. 10.3 Evaluate the importance of the myelin sheath around certain nerve fibers. 10.4 Explain how local electrical changes generate a nerve signal. 10.5 Describe the role of specific electrolytes in transmitting an action potential along a single neuron. 10.6 Explain how action potentials are transmitted from one neuron to another.	MASG - 1.1h1 (A), 2c1,2, 3.1c1,2 Appendix 4c (all A)
11. Describe the location and function of the central nervous system structures (brain and spinal cord).	11.1 Locate the two types of tissue in the central nervous system and state their locations.	MASG - 1.1h1 (A), 2c1,2, 3.1c1,2

Learning Outcome	Objectives	Competency Profile
	11.2 Identify the five lobes of the cerebrum. 11.3 Explain how the brain controls the skeletal muscles. 11.4 Compare and contrast the parts of the cerebrum that interpret somatic sensory signals versus signals from the special senses. 11.5 Differentiate the function of white versus gray matter in the central nervous system. 11.6 Describe the locations and functions of the three major components of the diencephalon. 11.7 Discuss the role of the cerebellum in movement and equilibrium. 11.8 Define the term brainstem and describe its anatomical relationship to the cerebellum and forebrain. 11.9 Outline the arrangement and functions of the meninges of the central nervous system. 11.10 Discuss the production, circulation and function of cerebrospinal fluid within chambers of the brain. 11.11 Describe the gross and microscopic anatomy of the spinal cord. 11.12 Distinguish the roles of the two roots that attach each spinal nerve to the spinal cord. 11.13 Identify the importance of the Circle of Willis in ensuring a constant perfusion of the cerebrum.	Appendix 4a (all A)
12. Describe the location and function of the peripheral nerves and associated somatic ganglia.	12.1 Locate various types of somatic sensory receptors. 12.2 Distinguish the twelve cranial nerves by name and their major function. 12.3 Identify the number and origin of spinal nerves.	MASG - 1.1h1 (A), 2c1,2, 3.1c1,2 Appendix 4b (all A)

Learning Outcome	Objectives	Competency Profile
	12.4 Name the nerve plexuses and the function of the main nerves from each.	
13. Describe the structure and function of the autonomic nervous system.	13.1 Differentiate the roles of the autonomic and somatic nervous systems. 13.2 Contrast the sympathetic and parasympathetic branches of the autonomic nervous system in terms of the origin of fibers, neurotransmitters used, and effects on target tissues. 13.3 Explain the relationship between the adrenal medulla and the sympathetic nervous system. 13.4 Differentiate the properties of cholinergic versus adrenergic (alpha and beta) receptors.	MASG - 1.1h1 (A), 2c1,2, 3.1c1,2 Appendix 4abc (all A)
14. Describe the anatomy of the sense organs and how they function.	14.1 Describe the structures of the receptors for taste and smell. 14.2 Summarize the composition and functions of the outer, middle, and inner ear. 14.3 Outline the structure and function of the sensory organs of the vestibular apparatus. 14.4 Describe the anatomy of the eye and its accessory structures. 14.5 Label the major chambers and structures of the eye. 14.6 Explain the chemical properties of tears. 14.7 Describe the structure of the retina and its receptor cells.	MASG - 1.1h1 (A), 2c1,2, 3.1c1,2 Appendix 4abc (all A)

Essential Employability Skills

Communication

- respond to written, spoken, or visual messages in a manner that ensures effective communication.

Numeracy

- not applicable

Critical Thinking and Problem Solving

- apply a systematic approach to solve problems.
- use a variety of thinking skills to anticipate and solve problems.

Information Management

- analyze, evaluate, and apply relevant information from a variety of sources.

Interpersonal

- interact with others in groups in ways that contribute to effective working relationships.

Personal

- manage the use of time and other resources to complete projects.

Delivery Method

- Classroom: Course is delivered through scheduled synchronous teaching that may be face-to-face and/or virtual.

Learning Activities

- Lectures
- Class Discussions
- Self-Directed Learning
- Case Studies
- eLearning Components

Resources Required**Books**

J. Gordon Betts, Kelly A. Young, James A. Wise, Eddie Johnson, Brandon Poe, Dean H. Kruse, Oksana Korol, Jody E. Johnson, Mark Womble, Peter DeSaix, *Anatomy & Physiology*, 2nd, OpenStax: access for free at <https://openstax.org/books/anatomy-and-physiology-2e>

ISBN: 978-1-951693-42-8

Price: \$ 0

Second Hand Permissible: ☐

Evaluation Plan**Grading Scheme**

A	80% - 100%
B	70% - 79%
C	60% - 69%
F	0% - 59%

Evaluation Method	Value (%)
Applied Activities (G)	25%
Students will complete 5 module-based assessments covering concepts discussed in corresponding chapters. Each module assessment will be equally-weighted (5% each)	
Test/Exam	75%
Test #1 (20%) Test #2 (20%) Comprehensive Final Exam (35%)	

ADDITIONAL INFORMATION

A course outline is the College's commitment to the students. It supports educators, students, employers, and external partners in determining the depth of knowledge and level of performance that a student will be able to demonstrate upon successful completion of a course. Both instructor and student are obligated to follow the content of the course outline. It is your responsibility to meet these outcomes as assigned.

Note: You should maintain a copy of this course outline for your records. You may require this course outline if you seek transfer credits or further studies at other institutions.

Cambrian Email Addresses

All email correspondence with currently registered students must be via the students' College-issued email, as per the College's [IT Acceptable Use Policy](#). Students must familiarize themselves with the IT Acceptable Use Policy, as it outlines the acceptable use of College information systems and technology, and mitigates risks to the College's IT infrastructure.

Bring Your Own Device (BYOD) and Apps Anywhere

Cambrian College is a BYOD institution, which means that students bring the device of their choice that meets program-specific minimum technology requirements. Program-specific minimum technology requirements can be viewed on program pages on the Cambrian College website. AppsAnywhere is an easy-to-use app store-like platform providing students with a way to access their College apps and software on demand, anywhere, anytime both on and off campus. These both enrich the student learning experience in and out of the classroom, while providing maximum flexibility.

Policies

It is the student's responsibility to be aware of the College's policies. Policies, procedures and forms can be found on the [College website](#).

Academic and Student Services

Cambrian has a variety of student and academic services to support students during their academic journey at the College.

- [Academic Integrity Office](#)
- [Academic Success Centre](#)
- [Bookstore and Campus Store](#)
- [International Student Support Services](#)
- [KPMG Pride Centre](#)
- [Career Centre](#)
- [Registrar's Office \(Enrolment Centre\)](#)
- [First Step Centre](#)
- [Accessibility Services](#)
- [Library](#)
- [Pathways](#)
- [Available Scholarships and Bursaries](#)
- [Cambrian Student Council \(CSC\)](#)
- [Cambrian Indigenous Student Circle \(CISC\)](#)
- [Cambrian Athletic Association \(CAA\)](#)
- [Student Life Centre](#)
- [Test Centre](#)
- [The Learning Centre \[Tutoring Services\]](#)
- [Wabnode Centre for Indigenous Services](#)
- [Women's Resource Centre](#)

Copyright

Copyright is the exclusive legal right given to a creator to reproduce, publish, sell, or distribute his/her work. All members of the Cambrian community are required to comply with Canadian copyright law, which governs the reproduction, use and distribution of copyrighted materials. This means that the copying, use and distribution of copyright-protected materials, regardless of format, are subject to certain limits and restrictions. For example, activities such as photocopying or scanning an entire textbook or uploading class materials to a course sharing site are prohibited.

See the [Cambrian Library website](#) for additional information regarding copyright and for details on allowable limits.

Audio/Visual Capture

Sounds and images from this class, and contributions made by a participant, virtually or in-person, are recorded under the authority of the *Ontario Colleges of Applied Arts and Technology Act, 2002*. The main purpose of these recordings is to allow students enrolled in the course to review content and engage in activities, whether they attend any given class in person, virtually, or at all. Class recordings are for personal use only and shall not be shared or transferred. Faculty may also review these recordings to prepare for future classes, evaluate students, collaborate in program reviews, or provide feedback to faculty and/or students. Any questions about the use of multimedia recordings may be addressed to your respective Dean.

Equity, Diversity, and Inclusivity

Cambrian is committed to building and preserving an equitable, diverse, and inclusive learning community where students, faculty, and staff may achieve their full potential in an environment characterized by equality of respect and opportunity. All students and employees have the right to live and work in an environment that is free from discrimination and harassment. Therefore, Cambrian College will not tolerate any form of discrimination or harassment in its employment, education, accommodation, or business dealings. For more information, please visit: [Equity, Human Rights, and Accessibility](#).

Prior Learning Assessment and Recognition (PLAR)

Students wishing to have work or life experience that meets course learning outcomes considered for credit through Prior Learning Assessment and Recognition should email the Enrolment Centre at records@cambriancollege.ca.

Transfer Credit

Students wishing to have courses from other programs or institutions assessed for equivalency and/or transfer credit should visit the [Transfer Credits page](#) on the Cambrian website. The student should maintain a copy of this course outline for their records. Students may require this course outline if seeking transfer credits or further studies at other institutions.

Test Proctoring at Cambrian

Many courses include major tests and/or final exams. The practice at Cambrian requires that these types of test situations involve proctoring to ensure academic integrity. Online tests/exams may employ a proctoring services to enable you to take your exam from a location of your choosing within a period specified by your instructor. When you are taking an online test/exam, the proctoring service may capture your video, screen, audio, and web surfing data to protect academic integrity. Cambrian College collects, uses, discloses, and retains personal information in compliance with the *Freedom of Information and Protection of Privacy Act (FIPPA)*. Your personal information is being collected under the authority of the *Ontario Colleges of Applied Arts and Technology Act S.O. 2002, c.8, Sched. F*. This information will be used for the purpose of administering a test/exam through an online proctoring service acting as an authorized agent of the College. Please refer to Cambrian's [Official Student Records Policy](#) for more details. If you have any questions regarding the collection of your

personal information, please contact Vice President Academic, Cambrian College, 1400 Barry Downe Rd., Sudbury ON P3A 3V8, 1-705-566-8101 ext. 6245.