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# CURRICULUM GUIDE: OFFICIAL COURSE OUTLINE

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| Course Code | BIOL 110 | Course Title | Anatomy and Physiology I | | | |
| Credit Value | 4 | Department | Mathematics and Science | | | |
| No. of weeks | 14 | Hrs. per week | *Lecture* | *Tutorial* | *Laboratory* | *Total* |
| | | | 3 | 0 | 3 | 6 |
| Course Description | Human anatomy is the science of the structure of the human body and its parts. This course covers the basics of cellular anatomy and tissue types, with a focus on the structure and function of the muscular, skeletal, cardiovascular, respiratory, immune and neural systems of the human body. An emphasis is placed on the homeostatic purpose and mechanisms of each body system discussed. | | | | | |
| Prerequisite(s) | ENGL 098 | | | | | |

| Initial Articulation Targets | *UBC* | *SFU* | *UVic* | *UNBC* | *TRU* |
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| | ELEV_V 1st (3), Precludes UBCV KIN_V 190 & UBCV KIN_V 191; ALEX BIOL 110 (4) & ALEX BIOL 120 (4) = UBCV BIOL_V 153 (7); ALEX BIOL 110 (4) & ALEX BIOL 120 (4) = UBCV KIN_V 190 (3) & UBCV KIN_V 191 (3) | BPK 105 (3) | BIOL 1XX (1.5) | ALEX BIOL 110 (4) & ALEX BIOL 120 (4) = UNBC HHSC 111 (4) & UNBC HHSC 112 (4) | BIOL 1592 (3) |
| | For updated information on the transferability of this course, please consult the BC Transfer Guide, www.bctransferguide.ca | | | | |

| Learning Outcomes | Upon successful completion of this course, the student will be able to: |
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- Describe the basic structure (anatomy) and function (physiology) of the muscular, skeletal, cardiovascular, respiratory, immune and neural system of the human body
- Identify anatomical landmarks on the human body
- Apply knowledge of anatomy and physiology to the study of basic human movement
- Discriminate between the structures and functions of cells, tissues, bones, joints, and muscles
- Explain the homeostatic interactions between cells and organ systems



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| | • Relate structure to function in the nervous system<br>• Identify components of and compare the anatomy and physiology of the peripheral and central nervous system<br>• Relate structure and function in the cardiovascular system<br>• Identify the components of and explain interactions in the immune system<br>• Relate structure and function in the respiratory system |
| Content | **Core** topics – all of the following will be covered:<br>• The structure and function of cells<br>  ○ The structure and function of cell membranes and various cytoplasmic and nuclear components<br>  ○ An explanation of the major cellular processes and their significance to the cell<br>  ○ Malfunctions of cellular organelles and the related disease consequences<br>• Introduction to biochemistry<br>  ○ The chemistry of water<br>  ○ The chemistry of carbohydrates, lipids, proteins and nucleic acids<br>  ○ Homeostasis<br>  ○ The definition of the term homeostasis, its importance, and the conditions required to fulfill homeostasis<br>  ○ The definitions of the terms internal environment, stress, positive feedback system and negative feedback system, and their roles in homeostasis<br>  ○ Examples of homeostatic mechanisms, including negative and positive feedback systems<br>• The skeletal system<br>  ○ The basic structure, histology, and components of the human skeleton<br>  ○ The structure, physiology, and function of bone<br>  ○ The changes in skeletal structure during growth and development (ossification)<br>• The muscular system<br>  ○ Overview of muscle types: skeletal muscle, cardiac muscle, smooth muscle<br>  ○ The gross anatomy of muscles and microscopic anatomy of muscle tissue<br>  ○ Cellular mechanisms of skeletal muscle contractions and their energy sources<br>  ○ Types of skeletal muscle fibers<br>  ○ The physiology of muscle contraction in relation to sarcomere length and tensile strength<br>• The cardiovascular system<br>  ○ The basic structure and function of the components of the cardiovascular system<br>  ○ Components of blood<br>  ○ Types of blood vessels<br>  ○ Anatomy and physiology of the heart<br>  ○ The physiology of the control of the cardiovascular system<br>  ○ The response of the cardiovascular system to stress<br>• The respiratory system<br>  ○ The basic structure and function of the components of the respiratory system<br>  ○ Diffusion of gasses across respiratory surfaces |

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| | ○ The physiology of the control of the respiratory system<br>○ The response of the respiratory system to exercise<br>• The immune system<br>○ The basic structure and function of the components of the immune system<br>○ The physiology of the control of the immune system in health and disease<br>○ The response of the immune system to stress<br>• The nervous system<br>○ The components of the nervous system and neurophysiology<br>○ Neuronal response to stimuli, graded potentials, action potentials and neurotransmitter release<br>○ Types of neurotransmitters and neurotransmitter receptors<br>○ Branches of the nervous system: central nervous system, peripheral nervous system, somatic nervous system, autonomic nervous system, sympathetic nervous system, and parasympathetic nervous system<br>○ Sensory receptors, spinal reflexes, and the spinal cord<br>○ Regulatory control of the sympathetic and parasympathetic branches of the autonomic nervous system<br>○ The regulatory role of the nervous system over the other systems of the human body<br><br>Additional topics may also be covered, at the discretion of the instructor.<br><br>Labs:<br>• Language of Anatomy<br>• Cellular Anatomy<br>• Classification of Tissues and Organ Systems<br>• Skeletal System Classification and Histology<br>• Skeletal System Bones, Bone Markings, Joints, and Articulation<br>• Muscular System<br>• Anatomy of the Heart<br>• Histology of Blood Vessels, Measuring Pulse and Blood Pressure<br>• Anatomy of the Brain |
| Methods of Instruction | Lectures, demonstrations, small group discussions, case study analysis, concept mapping, and internet research. |
| Required Textbook(s) | The following textbook(s) is/are required, or approved equivalent(s).<br><br>Marieb, Elaine and Lori Smith. Laboratory Manual for Anatomy & Physiology. 7th Edition Pearson Publishing, 2019.<br><br>Tortora, Gerard and Bryan Derrickson. Principles of Anatomy and Physiology. 16th Edition. New Jersey: Wiley & Sons Publishing, 2020. |

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| Required Equipment and Technology | Students are required to have a computer with internet access.<br>The following resources are provided by the College:<br>• Office 365<br>• Student email | | |
| Homework Hours | At minimum, students can expect one hour of homework for every hour of instructional time. | | |
| Evaluation | *Component*<br>Quizzes and assignments<br>Laboratory experiments and activities<br>• Weight divided over 9 labs<br>Comprehensive laboratory exam<br>Midterm exam<br>Comprehensive final exam | *% Value*<br>10-15%<br>15-20%<br><br>15-20%<br>15-20%<br>30-35% | |
| Completion Requirements | The minimum grade to pass this course is D (50%). Unless otherwise stated, a minimum grade of C- (55%) is required for this course to fulfil a prerequisite. | | |
| Course Designer(s) | Sharon Gillies, Ph.D., (Head) Department of Biology, University of the Fraser Valley<br>Dr. Mitra Panahi, Biology Instructor, Alexander College | Consultant(s), *if applicable* | Amber Johnston, BKin, MSc., Department of Kinesiology and Physical Education, University of the Fraser Valley |
| Dean's Approval | Barbara Moon, Ph.D. Dean of Arts and Sciences, Alexander College | Dean's Approval Date | January 5, 2015 |
| Curriculum Committee Approval Date | January 5, 2025 | First Term Offered | Fall 2015 |
| Last Review Date | September 1, 2024 | Next Review Date | September 1, 2029 |
| Revision History | February 8, 2017-Course title changed from 'Anatomy and Physiology' to 'Anatomy and Physiology I' to help distinguish the course from Anatomy and Physiology II, developed in 2017. MB<br><br>September 1, 2024 – Laboratory assessments revised by Kelly Cheung. | | |