Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: BIOL 132 **Year: 2025-2026**

Course Title: Principles of Human Anatomy and Physiology II **Credit Hours: 4**

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for accommodations. All course materials are available in alternate formats upon request.*

Course Description

Topics covered include the endocrine, cardiovascular, lymphatic, respiratory, digestive, and urogenital systems. BIOL 132 fulfills the SUNY General Education Natural Sciences requirement. Prerequisites: C or better in BIOL 131; MATH 095 or MATH 098; RDNG 116, and ENGL 100 if required by placement testing. 4 Cr. (3 Lec., 3 Lab.) Spring semester.

Course Context/Audience

This is a four credit course required for students enrolled in the Nursing A.A.S. degree program. It may also be an appropriate course for individuals contemplating a career in recreation, physical therapy, biology, physical education, medicine or chiropractic (depending on evaluation by their intended transfer institution).

Basic Skills/Entry Level Expectations

Writing:	WC	College level writing skills are required. See course co-requisites or pre-requisites.
Math:	M3	MATH 095 or MATH 098 if required by placement testing.
Reading:	R3	Course may be taken concurrently with RDNG 116.

Course Goals

This second course of a two semester course sequence will prepare the student to take additional course work in fields, such as the TC3 Nursing program, which require a full year of course work in human anatomy and physiology.

Course Objectives/Topics

Objective/Topic	# Hours
Endocrine System - Students who have completed this section of the course should be able to identify and describe the major gross and macroscopic anatomical components of the endocrine system and explain the functional roles of their respective hormones in communication, control, and integration. This section of the course includes the following topics: general functions of the endocrine system, definition and chemical classification of hormones, control of hormone secretion, mechanisms of hormone actions at effectors, roles of the hypothalamus and pituitary, identity, secretory control and functional roles of the major hormones of the pituitary, adrenal, thyroid, parathyroid, pancreas, including the effects of hypo- and hyper-secretion, patterns of hormonal action (including antagonistic, synergistic, permissive, and integrative). Since the endocrine system plays a key role in the regulation and integration of body organ systems, detailed aspects of endocrine function will be emphasized throughout both semesters of the course. (This course, unlike the 200 level course, focuses only on those specialized endocrine glands and their products as listed above - other tissues which also produce hormones, such as the kidney, heart, digestive tissues, reproductive tissues, etc., will be discussed as those tissues/systems are discussed in the context of the functional control of those systems and their integration with other body systems as a whole.)	9 Hours
Cardiovascular System - Students who have completed this section of the course should be able to identify and describe the major gross and microscopic anatomical components of the cardiovascular system and explain their functional roles in transport and hemodynamics. This section of the course includes: general functions of the CV system, formation and composition of blood plasma, identity, microscopic anatomy, numbers, formation, and functional roles of the formed elements of the blood, hemostasis, including coagulation of the blood, gross and microscopic anatomy of the heart, the conduction system of the heart, pattern of blood flow through the heart, and to the major vessels leading directly to or from the heart, the cardiac cycle, including the basic rhythm of heartbeat, pressure and volume changes, heart sounds, and an introduction to the ECG, regulation of stroke volume and heart rate, anatomy and functional roles of the different types of blood vessels, systemic and pulmonary patterns of circulation, an introduction of blood pressure and its functional relationship to cardiac output, peripheral resistance, and hemodynamics. (This course, unlike the 200 level course, focuses on an introduction to these topics to allow students to understand the homeostatic mechanisms at work to maintain blood flow and basic heart functions. In addition, only a limited number of major systemic and pulmonary vessels are required. The physiology of the system and its context in the maintenance of body function is emphasized more than the anatomy of the system.)	25 Hours
Lymphatic System - Students who have completed this section of the course should be able to identify and describe the gross anatomical components of the lymphatic system and explain their functional roles in fluid dynamics. (This course, unlike the 200 level course, only covers the lymphatic system as it pertains to maintaining blood volume. Specifics of immune system function by this system is omitted here, but covered in the BIOL 112 - Medical Microbiology course, which is a required course for all nursing students.) This section of the course includes: general functions of the lympahatic system, gross anatomy including the pattern of lymph circulation, lymph formation and flow mechanisms.	3 Hours
Respiratory System - Students who have completed this section of the course should be able to identify and describe the major gross and microscopic anatomical components of the respiratory system and explain their functional roles in breathing/ventilation and in the processes of external and internal respiration. This section of the course includes: general functions of the respiratory system, gross and microscopic anatomy of the respiratory tract and related organs, mechanism of pulmonary ventilation, air volumes and capacities (spirometry), mechanism of gas exchange in lungs and tissues, respiratory gas transport in the blood, control of pulmonary ventilation.	12 Hours
Digestive System - Students who have completed this section of the course should be able to identify and describe the major gross and microscopic anatomical components of the digestive system and explain their functional roles in digestion, absorption, nutrition, metabolism, excretion, and elimination. This section of the course includes: general functions of the digestive system, gross and microscopic anatomy of the GI tract and the accessory organs of digestion, mechanical and chemical processes of digestion and absorption, processes of excretion and elimination, hormonal and neural regulation of digestive processes, homeostatic integration with other systems. (This course, unlike the 200 level course, does not cover nutrition and metabolism. The intent is that this course will integrate information learned in the prerequisite coursework concerning nutrition and metabolism with details of the function of the digestive system to provide an overall view of the function of this system in maintaining homeostasis.)	12 Hours

Urinary system - Students who have completed this section of the course should be able to identify and describe the major gross and microscopic anatomical components of the urinary system and explain their functional roles. This section of the course includes: general function of the urinary system, gross and microscopic anatomy of the urinary tract, including histology of the nephron, processes of urine formation, including filtration, reabsorption and secretion, and excretion of urine, factors regulating and altering urine volume and composition, including the renin-angiotension mechanism and the roles of ADH and aldosterone, endocrine activities of the kidney that affect other systems, including Vit D activation and secretion of erythropoietin, innervation and control of the urinary bladder.	9 Hours
Fluid /Electrolyte and Acid/Base Balance - Students who have completed this section of the course should be able to identify and describe the physiology of the homeostatic mechanisms that control fluid electrolyte and acid/base balance. This section of the course includes: identification and description of the major fluid compartments, including intracellular, extracellular, intravascular, and interstitial (including volume and chemical composition of these fluids), regulation of water intake/output, maintenance of sodium, potassium and calcium ions levels (and a review of the hormones that effect their control), buffer systems and their roles in acid/base balance, and which are used within each compartment, roles of the urinary and respiratory systems in acid/base balance.	3 Hours
Reproductive System - Students who have completed this section of the course should be able to identify and describe the major gross and microscopic anatomical components of the male and female reproductive systems and explain their functional role in reproduction.(This course, unlike the 200 level course, does not include a discussion of pregnancy, early development of the fetus, parturition, labor, or the changes to this system at the climateric. This material is discussed during coursework included within the nursing program - esp. NURS 110 and 208.) This section of the course includes the following topics: general functions of the reproductive system, gross anatomy and specific roles of structures of the male and female reproductive tracts and external genitalia, reproductive cell division (meiosis, gametogenesis), neural and hormonal regulation of reproductive functions, including puberty, the female ovarian and menstrual cycles, spermatogenesis.	12 Hours

General Education Goals - Critical Thinking & Social/Global Awareness

CRITICAL THINKING OUTCOMES	**HOW DOES THE COURSE ADDRESS THE OUTCOMES** (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
Students will be able to ➢ develop meaningful questions to address problems or issues. ➢ gather, interpret, and evaluate relevant sources of information. ➢ reach informed conclusions and solutions. ➢ consider analytically the viewpoints of self and others.	

SOCIAL/GLOBAL AWARENESS OUTCOMES	HOW DOES THE COURSE ADDRESS THE OUTCOMES (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
➢ Students will begin to understand how their lives are shaped by the complex world in which they live. ➢ Students will understand that their actions have social, economic and environmental consequences.	

Instructional Methods
This course should be taught using a lecture/lab format. The laboratory portion may include dissection of preserved animals (pigs, cats) and organs (hearts, kidneys, brains, joints, etc.) as appropriate. In addition, the use of the microscope to examine various body tissues is crucial for understanding of the connection between structure and function. It is essential that, as study of the human body progresses, parts be integrated into the whole. Unifying themes, such as homeostasis, and control of homeostasis through both neural and endocrine mechanisms, should be emphasized throughout both semesters of the sequence.

Methods of Assessment/Evaluation

Method	% Course Grade
Exams, including content covered in both lecture and laboratory	80%
Quizzes on lecture and lab materials	20%

Text(s)

Anatomy and Physiology, Marieb, Elaine N., 3rd Edition, © 2007 Benjamin Cummings.
Note: Any two (2) semester text and lab manual is appropriate for this course - any text published within the last five years is probably acceptable. In the past, TC3 faculty have used texts by Spence and Mason, Marieb, Tortora, and Martini. The Marieb lab manual, however, has been the standard.

Laboratory Manual for Anatomy and Physiology, Marieb, Elaine N., 3rd Edition, © 2007 Benjamin Cummings.
Note: Any two (2) semester text and lab manual is appropriate for this course - any text published within the last five years is probably acceptable. In the past, TC3 faculty have used texts by Spence and Mason, Marieb, Tortora, and Martini. The Marieb lab manual, however, has been the standard.

Bibliography
Not available at this time

Other Learning Resources

Audiovisual

Various films and videos - especially "The Work of the Heart" and "The Work of the Kidneys"
Check the database and ask the personnel at the AV desk for information on what is available, both in-house and through BOCES.

Electronic

The text has numerous links to internet resources.

Other

The college owns several sets of the ADAM Interactive Physiology CD program - this set is excellent for demonstration of difficult concepts, contains animations of some physiological processes, and has been used by many students as one method to review basic anatomy of various systems, and self-test understanding of concepts.