**Tompkins Cortland Community College**

# Master Course Syllabus

**Course Discipline and Number: BIOL 131** **Year: 2025-2026**

**Course Title: Principles of Human Anatomy and Physiology I** **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

Students are introduced to the basic organization of the human body, basic biochemistry involved in physiological interactions, basics of tissue organization, and histology. In addition, the course surveys the integumentary, skeletal, muscular and nervous systems of the human body. BIOL 131 fulfills the SUNY General Education Natural Sciences requirement. Prerequisites: Recent (within the last five years) NYS Regents exam in biology and chemistry (passed with an 80% grade or better) or a C or better in BIOL 104 or a C or better CHEM 101 and BIOL 101. MATH 095 or MATH 098, RDNG 116, and ENGL 100 if required by placement testing. 4 Cr. (3 Lec., 3 Lab.) Fall semester.

## Course Context/Audience

This is a four-credit required course for the Nursing A.A.S. degree. It may also be appropriate 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 Prior completion or concurrent enrollment in RDNG 116 if required by placement testing.

## Course Goals

This course will prepare the student to take additional course work in fields requiring a full year of human anatomy and physiology.

## Course Objectives/Topics

| Objective/Topic | # Hours |
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| Body Plan and Organization - Students who have completed this section of the course should understand the scope of studies in anatomy and physiology and be able to use and understand correct and appropriate anatomical and directional terminology and descriptions. This topic sets the basis for all further discussion of anatomy. This section of the course covers: anatomical position, body planes and sections, body regions, body cavities, directional terms, basic terminology, levels of organization, survey of body systems. | 4 Hours |

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| Homeostasis - Students who have completed this section of the course should be able to explain the basic concept of homeostasis and how homeostatic mechanisms apply to body systems. This is an important unifying theme, and detailed aspects of homeostatic control will be emphasized throughout both semesters of this course sequence. This section of the course covers: negative and positive feedback, homeostatic mechanisms, control systems. In addition, an introduction to the fluid and electrolyte balance of the body serves as a good overall example of these mechanisms. | 2 Hours |
| Chemical Basis for Life and Cell Biology - This section is a review of materials covered in pre-requisite course work. Students who have completed this section should be able to understand that life is based on reactions occurring at the chemical level of organization, and identify cellular structures and explain their functions in maintaining the activities of the organism as a whole. (The intent of the course pre-requisites is to minimize the amount of time spent on this section.) This section of the course covers: atoms and molecules, chemical bonding, inorganic compounds and solutions (including the concept of pH), organic compounds, the concept of concentrations of solutions (molarity/osmolarity), energy transfer using ATP, intracellular organization of nucleus and cytoplasm, membrane structure and function, mechanisms for movement of materials across cellular membranes, organelles, protein synthesis, basics of cellular respiration, somatic cell division (mitosis and cytokinesis). | 6 Hours |
| Histology - Students who have completed this section of the course should be able to describe and locate the basic tissues of the body and explain their functions. This section of the course covers: microscopic anatomy, embryological origin and location and functional roles of all the basic tissue types (epithelial, connective, muscle and nervous), and membranes (synovial, mucous, and serous). | 6 Hours |
| Integumentary 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 integumentary system and describe the functions of the system. This section of the course covers: general functions of the skin, gross and microscopic anatomy of the skin and accessory structures, roles of the specific layers of the skin, roles of the accessory organs. | 4 Hours |
| Skeletal 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 skeletal system and explain their functional roles in osteogenesis, repair, and body movement. ** This course, unlike the 200 level course, focuses only on those bones, bony landmarks and joints to which the limited number of muscles required to be learned for this course are attached, and those structures and joints which will be discussed in the context of other systems' functional use of those landmarks. ** This section of the course covers: general functions of bone and the skeletal system, histology and structure of a typical bone, introduction to the physiology of bone formation, growth, remodeling and repair, names and landmarks of bones, organization of the skeleton, structure and function of joints, classification of joints, range of motion and angular body movements . | 15 Hours |
| Muscular 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 muscular system, and explain their functional roles in body movement, maintenance of posture, and heat production. **This course, unlike the 200 level course, focuses only on a limited number of (mainly) superficial muscles that are of importance in maintaining range of motion of the body. ** This section of the course covers: general functions of muscle tissue, identification, general location, and comparative characteristics of the three types of muscle tissue, detailed gross and microscopic anatomy of skeletal muscle, physiology of skeletal muscle contraction, skeletal muscle metabolism, nomenclature, location and function of major skeletal muscles, group actions of skeletal muscles (prime movers, etc.) | 15 Hours |
| Nervous 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 nervous system and explain their functional roles in communication, control, and integration for the organism as a whole. Since the nervous system is especially important to integration, detailed aspects of its function will be reiterated at various times throughout both semesters of this course sequence. **This course, unlike the 200 level course, will provide an introduction to the nervous system anatomy, with a limited number of structures required. ** This section of the course covers: general functions of the nervous system, organization from both the functional and structural perspectives, gross and microscopic anatomy of nervous tissue, neurophysiology (including the mechanism of resting membrane potential, production of action potentials, and impulse transmission), neurotransmitters and their roles in synaptic transmission, sensory receptors and their roles, structure and function of the parts of the brain, protective roles of the cranial bones, meninges, and CSF, structure and function of cranial nerves, anatomy of the spinal cord and spinal | 24 Hours |

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| nerves, cranial and spinal reflexes and their roles in maintaining homeostasis, introduction to motor and sensory pathways, functions and divisions of the autonomic nervous system, comparison of somatic and autonomic nervous systems. | |
| Special Senses - Students who have completed this section of the course should be able to identify and describe the major gross and microscopic anatomy of the eye and ear and explain their functional roles in vision, hearing and equilibrium. Students should also be able to identify and locate the receptors responsible for olfaction and gustation, and briefly describe the physiology of smell and taste. This section of the course covers: introduction to the gross and microscopic anatomy of the eye and ear, roles of specific tissues of the eye and ear in vision and hearing and equilibrium, olfactory and gustatory receptors and their integrated roles in smell and taste. | 6 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<br>➢ develop meaningful questions to address problems or issues.<br>➢ gather, interpret, and evaluate relevant sources of information.<br>➢ reach informed conclusions and solutions.<br>➢ 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.<br>➢ 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.) 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.

**Methods of Assessment/Evaluation**

| Method | % Course Grade |
|---|---|
| Exams including lecture and lab materials | 80% |
| Quizzes on lecture and lab materials | 20% |

**Text(s)**

Anatomy and Physiology, Elaine N. Marieb, 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, Elaine N. Marieb, 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**

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| **Audiovisual**<br>Check the database and ask the personnel at the AV desk for information on what is available, both in-house and through BOCES. |
| **Electronic**<br>Innumerable resources are available online through the text's websites and other searchable databases and sites. |
| **Other**<br>The college owns (and will loan to faculty and students with a valid ID) several sets of a complementary CD rom set - "ADAM Interactive Physiology" - these CD's are very helpful in reviewing basic anatomy of systems, and provide animations of some of the more difficult concepts. These CD's can be brought into the classroom on the "roving computers" available from the AV desk to supplement the lecture/lab, or used in any of the smart classrooms. |