

# PHSO R101: HUMAN PHYSIOLOGY

## Originator

snewby

## College

Oxnard College

## Discipline (CB01A)

PHSO - Physiology

## Course Number (CB01B)

R101

## Course Title (CB02)

Human Physiology

## Banner/Short Title

Human Physiology

## Credit Type

Credit

## Start Term

Fall 2023

## Catalog Course Description

This course emphasizes principles of cellular and systemic functions of the human body. Lecture topics include scientific method, basic inorganic and organic chemistry, solute as well as water transport and balance, homeostatic mechanisms, and functions of the major organ systems. This course emphasizes demonstrations and techniques of commonly utilized laboratory equipment. Laboratory topics will primarily consist of analysis, interpretation and evaluation of data gathered relating to homeostatic mechanisms, functions of the major organ systems and disease. Experiments reinforce material presented in lecture.

## Additional Catalog Notes

Students are strongly advised to have previously completed the general biology lecture and laboratory courses before taking physiology if they have not already done so. General biology provides foundational knowledge of cells, cellular functioning, and laboratory equipment that students are expected to be familiar with but are not covered in anatomy.

## Taxonomy of Programs (TOP) Code (CB03)

0410.00 - Anatomy and Physiology

## Course Credit Status (CB04)

D (Credit - Degree Applicable)

## Course Transfer Status (CB05) (select one only)

A (Transferable to both UC and CSU)

## Course Basic Skills Status (CB08)

N - The Course is Not a Basic Skills Course

## SAM Priority Code (CB09)

E - Non-Occupational

## Course Cooperative Work Experience Education Status (CB10)

N - Is Not Part of a Cooperative Work Experience Education Program

## Course Classification Status (CB11)

Y - Credit Course

## Educational Assistance Class Instruction (Approved Special Class) (CB13)

N - The Course is Not an Approved Special Class

**Course Prior to Transfer Level (CB21)**

Y - Not Applicable

**Course Noncredit Category (CB22)**

Y - Credit Course

**Funding Agency Category (CB23)**

Y - Not Applicable (Funding Not Used)

**Course Program Status (CB24)**

1 - Program Applicable

**General Education Status (CB25)**

Y - Not Applicable

**Support Course Status (CB26)**

N - Course is not a support course

**Field trips**

May be required

**Grading method**

(L) Letter Graded

**Does this course require an instructional materials fee?**

No

**Repeatable for Credit**

No

**Is this course part of a family?**

No

**Units and Hours**

**Carnegie Unit Override**

No

**In-Class**

**Lecture**

**Minimum Contact/In-Class Lecture Hours**

52.5

**Maximum Contact/In-Class Lecture Hours**

52.5

**Activity**

**Laboratory**

**Minimum Contact/In-Class Laboratory Hours**

105

**Maximum Contact/In-Class Laboratory Hours**

105

**Total in-Class****Total in-Class****Total Minimum Contact/In-Class Hours**

157.5

**Total Maximum Contact/In-Class Hours**

157.5

**Outside-of-Class****Internship/Cooperative Work Experience**

Paid

Unpaid

**Total Outside-of-Class****Total Outside-of-Class****Minimum Outside-of-Class Hours**

105

**Maximum Outside-of-Class Hours**

105

**Total Student Learning****Total Student Learning****Total Minimum Student Learning Hours**

262.5

**Total Maximum Student Learning Hours**

262.5

**Minimum Units (CB07)**

5

**Maximum Units (CB06)**

5

**Prerequisites**

ANAT R101; and CHEM R104; or CHEM R110;

**Advisories on Recommended Preparation**

BIOL R101; or BIOL R101H; and BIOL R101L; eligibility for ENGL R101; and a course taught at the level of intermediate algebra or placement as determined by the college's multiple measures assessment process

**Entrance Skills****Entrance Skills**

A general knowledge and understanding of histology of organs and organ systems, their locations and relationships.

**Prerequisite Course Objectives**

ANAT R101-Discuss both the gross and macro-anatomical structures and basic functions of the human system using accepted anatomical terms, planes, and points of reference.

ANAT R101-Distinguish the major cell and tissue types based on their morphology and functional characteristics.

ANAT R101-Predict, explain and analyze which cell or tissue type would be located in a given region based on the known characteristics of cells and tissues.

ANAT R101-Identify and recognize the parts of the human organ systems focusing most intently on the integument, skeletal, muscular, nervous, endocrine, digestive, circulatory, respiratory and uro-genital systems.

ANAT R101-Use a light microscope competently and report accurately the observation made while using prepared slides.

ANAT R101-Describe the key structural features of different human cell and major tissue types.

ANAT R101-Identify and describe the anatomy of the systems of the systems of the human body.

ANAT R101-Relate structure and function at the cellular through system levels of organization of human body systems.

ANAT R101-Describe structural and anatomical changes that occur in disease, injury, congenital malformation or aging of the human body systems.

ANAT R101-Use the tools and techniques required to complete a detailed dissection of cat and other livestock organs. Compare and contrast cat and other livestock organs to human examples.

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**Entrance Skills**

An adequate comprehension of general chemical processes and molecular including bimolecular interactions.

**Prerequisite Course Objectives**

CHEM R104-Explain the difference among atoms, molecules, ions, chemical compounds, and mixture.

CHEM R104-Describe the solubility and calculation of the mass percent and molarity of a solution.

CHEM R104-Identify formulas and names of acids, bases, and salts.

CHEM R104-Analyze the principles of acid-base reaction and oxidation-reduction reaction.

CHEM R104-Explain the rate of a chemical reaction and energy associated with a chemical reaction.

CHEM R104-Describe the basic nuclear reactions and their medical application.

CHEM R104-Classify the families of organic compounds according to their functional groups.

CHEM R104-Assess the impact of organic compounds in the human body and modern society.

CHEM R104-Recognize the relationships of carbohydrates, proteins, and lipids in the human body.

CHEM R104-Describe the metabolism and biochemical production in the human body.

CHEM R104-Recognize the basic structures and functions of DNA and RNA.

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**Entrance Skills**

An adequate comprehension of general chemical processes and molecular including bimolecular interactions.

**Prerequisite Course Objectives**

CHEM R110-Analyze the fundamental features of chemistry including the measurement and mathematical conversions of physical properties such as mass, volume, density, pressure, temperature, solutions, concentrations, and dilutions.

CHEM R110-Perform conversions using the technique of dimensional analysis and memorized metric conversion factors.

CHEM R110-Give the names and symbols of the common elements.

CHEM R110-Name or give the formulas of simple inorganic compounds.

CHEM R110-Identify and give general physical properties of the three states of matter and then describe the phase-changes between the three states.

CHEM R110-Differentiate clearly between chemical and physical changes, and among elements, compounds and mixtures.

CHEM R110-Write and evaluate chemical reactions and balance chemical equations.

CHEM R110-Perform stoichiometric calculations using the mole concept and molar mass to determine weight percent composition, empirical formula, molecular formula, theoretical yield, percent yield and limiting reactant.

CHEM R110-Describe atomic structure in terms of protons, neutrons, and electrons using the Bohr model.

CHEM R110-Relate electron configuration to the periodic table, and use the periodic table to predict or explain variations in atomic size, ionization energy, electronegativity, and metallic or non-metallic character.

CHEM R110-Describe covalent and ionic bonding in simple terms. Predict molecular shapes and polarities based on VSEPR (Valence Shell Electron Pair Repulsion) Theory.

CHEM R110-Describe and explain the properties of gases in terms of KMT (Kinetic Molecular Theory). Calculate gas properties from the gas laws.

CHEM R110-Describe the properties of water and other liquids.

CHEM R110-Categorize the properties of solutions and describe the solution process on a molecular level.

CHEM R110-Give common concentration units and use them to perform calculations involving solutions.

CHEM R110-Describe properties of acids and bases, calculate pH, and compare and contrast the behavior associated with acids and bases.

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**Entrance Skills**

Students must be able to read critically, and write a college-level essay that includes a thesis statement, well-formulated paragraphs, and be familiar with MLA documentation.

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**Entrance Skills**

Intermediate algebra or equivalent - The ability to grasp college level algebraic expressions and problems to comprehend numerical and statistical information presented as well as utilizations and calibration of laboratory equipment.

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**Entrance Skills**

Foundational knowledge of the scientific method, cells, and cellular functioning

**Prerequisite Course Objectives**

BIOL R101-Describe the scientific method of inquiry as it relates to biological organisms.  
 BIOL R101-Describe the structure and function of cells and common organelles and their relationship to tissues, organs, and organ systems.  
 BIOL R101-Explain the chemical and molecular basis for human nutritional needs.  
 BIOL R101-Explain energy flow through the biological world with reference to photosynthesis, cellular respiration, and ecological cycles.  
 BIOL R101-Summarize the role of nucleic acids in protein synthesis.  
 BIOL R101-Define and explain mechanisms of biological change and evolution.  
 BIOL R101-Apply critical thinking skills in recognizing the impacts of biology in society.  
 BIOL R101-Describe current issues and applications of biotechnology.

**Entrance Skills**

Foundational knowledge of the scientific method, cells, and cellular functioning

**Prerequisite Course Objectives**

BIOL R101H-Describe the scientific method of inquiry as it relates to biological organisms.  
 BIOL R101H-Describe the structure and function of cells and common organelles and their relationship to tissues, organs, and organ systems.  
 BIOL R101H-Explain the chemical and molecular basis for human nutritional needs.  
 BIOL R101H-Explain energy flow through the biological world with reference to photosynthesis, cellular respiration, and ecological cycles.  
 BIOL R101H-Summarize the role of nucleic acids in protein synthesis.  
 BIOL R101H-Define and explain mechanisms of biological change and evolution.  
 BIOL R101H-Apply critical thinking skills in recognizing the impacts of biology in society.  
 BIOL R101H-Describe current issues and applications of biotechnology.

**Entrance Skills**

Experience with laboratory safety and use of laboratory equipment

**Prerequisite Course Objectives**

BIOL R101L-Identify the different components of the scientific method of inquiry.  
 BIOL R101L-Recognize appropriate units of measurement in the metric system.  
 BIOL R101L-Recognize animal, plant, and bacterial cells and their sub-cellular structures.  
 BIOL R101L-Use basic laboratory equipment including a light microscope, a spectrophotometer, and different tools for measuring volume such as a beaker or graduated cylinder.  
 BIOL R101L-Describe cellular and biological processes including osmosis, photosynthesis, cellular respiration, mitosis, meiosis, and protein synthesis.

**Requisite Justification****Requisite Type**

Prerequisite

**Requisite**

ANAT R101

**Requisite Description**

Course not in a sequence

**Level of Scrutiny/Justification**

Content review

**Requisite Type**

Prerequisite

**Requisite**

CHEM R104

**Requisite Description**

Course not in a sequence

**Level of Scrutiny/Justification**

Content review

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**Requisite Type**

Prerequisite

**Requisite**

CHEM R110

**Requisite Description**

Course not in a sequence

**Level of Scrutiny/Justification**

Content review

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**Requisite Type**

Advisory

**Requisite**

Eligibility for ENGL R101

**Requisite Description**

Course not in a sequence

**Level of Scrutiny/Justification**

Content review

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**Requisite Type**

Advisory

**Requisite**

Course taught at the level of intermediate algebra or placement as determined by the college's multiple measures assessment process

**Requisite Description**

Course not in a sequence

**Level of Scrutiny/Justification**

Content review

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**Requisite Type**

Advisory

**Requisite**

BIOL R101

**Requisite Description**

Course not in a sequence

**Level of Scrutiny/Justification**

Content review

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**Requisite Type**

Advisory

**Requisite**

BIOL R101H

**Requisite Description**

Course not in a sequence

**Level of Scrutiny/Justification**

Content review

**Requisite Type**

Advisory

**Requisite**

BIOL R101L

**Requisite Description**

Course not in a sequence

**Level of Scrutiny/Justification**

Content review

**Student Learning Outcomes (CSLOs)**

**Upon satisfactory completion of the course, students will be able to:**

- |   |  |
|---|--|
| 1 | Analyze the concepts of physiologic theories as they relate to the clinical issues in the treatment of a particular disease. |
| 2 | Apply terms in interpretation of data gathered for genetic problems.   |

**Course Objectives**

**Upon satisfactory completion of the course, students will be able to:**

- |   |  |
|---|--|
| 1 | Define and recall terms used to describe the physiological processes covered in the course.                        |
| 2 | Apply these terms in interpretation of data gathered in lab and utilized in the construction of tables and graphs. |
| 3 | Explain the basic concepts of physiology and relate them to clinical situations.                                   |
| 4 | Analyze and evaluate the concepts of physiologic theories as they relate to the laws of physics and chemistry.     |
| 5 | Write clear, concise and coherent expositions that demonstrate the ability to communicate physiological concepts.  |
| 6 | Properly use common laboratory equipment such as spectrophotometer, auto-pipettes, centrifuge, etc...              |
| 7 | Safely perform a variety of lab procedures and techniques.   |
| 8 | Work effectively in laboratory group settings.   |

**Course Content****Lecture/Course Content**

1. Scientific Method
  - a. Classic – observation, hypothesis, test, data / results / conclusion, theory
  - b. Modern – assumption, description / explanation, humility
2. Scientific Classification
  - a. Characteristics of life
  - b. Homeostasis
  - c. Comparative and pathophysiology
  - d. Systems and development of the human organism
3. Basic Organic and Inorganic Chemistry
  - a. Solutions, concentration measurement, diffusion, osmosis, passive and active transport, pH and polymerization
  - b. Fluid exchange and regulation, fluid compartments
  - c. Metabolism, energy transformations, ATP, glycolysis, Krebs cycle, electron transport chain, carbohydrate metabolism, lipid metabolism, protein metabolism, beta fatty oxidation, Cori cycle
4. Integumentary System

- a. Thermoregulation, hydroregulation, sensation and receptors, hormone production, immunity
- b. Burns, dermatology, accessory structures, cancer, tension lines
- c. Dermatomes
5. Skeletal Muscular System
  - a. Structure, fiber types and metabolism, lever systems, exercise, energy requirements during exercise
  - b. Twitch, summation, tetany, fatigue, treppe
  - c. Mechanism of contraction, reflexes and neural control, myotomes, electrical muscle stimulation
6. Nervous System
  - a. Neurons and neuroglia, nerves, tracts, roots, structure, neuronal electrical activity
  - b. Conduction, transmission, synapses, neurotransmitters, reflex arcs, sympathetic and parasympathetic outflow, graded and action potentials, memory and learning
  - c. Vision, refraction, accommodation, acuity, dominance, color-blindness, myopia, hyperopia, presbyopia, emmetropia, ophthalmoscopic examination
  - d. Audition and equilibrium, physics of sound waves, localization, pitch and amplitude, processing written and heard words, linear / horizontal and vertical acceleration, hearing and balance impairments
  - e. Olfaction and gustation, localization, association, transduction
7. Digestive System
  - a. Mechanical and chemical breakdown, catabolism and anabolism, enzymes
  - b. Primary and accessory organs, immunity, diets, vegetarianism, fat analysis
8. Cardiovascular System
  - a. Blood plasma, formed elements, blood solutes, dissolved gases, coagulation
  - b. Blood types, non-specific and specific immunity, B and T lymphocytes, active and passive immunity
  - c. Heart structure, cardiac cycle, heart sounds and auscultation, murmurs, electrical conduction and the EKG, arrhythmias, cardiac output, blood pressure, vasculature, fluid resistance, arteriosclerosis, atherosclerosis, hypertension, hypotension, stroke and myocardial infarct
9. Lymphatic System
  - a. Interstitial fluid, edema, cervical chains, lymphoma, nodes and organs, gustatory and respiratory associated lymphatic tissue, drainage
10. Respiratory System
  - a. Structures, ventilation, partial pressures, effects of pH, neural centers
  - b. Oxygen and carbon dioxide transport, hemoglobin, myoglobin, altitude effects, underwater respiration, effects of exercise
11. Urinary System
  - a. Structure, blood supply, glomerular filtration and reabsorption, solute clearance, counter-current multiplier system, salt and acid-base balance
  - b. Nephritis, cystitis, kidney stones, UTI, BPH, incontinence
12. Endocrine System
  - a. Mechanisms and actions, tissue generation and targets, prostaglandins and paracrines
  - b. Conditions of excessive and deficient secretion
13. Reproductive System
  - a. Female and male comparative systems and functions, embryologic development
  - b. Uterine cycle, ovarian cycle, male cycle, parturition, birth defects
  - c. Sexually transmitted disease, birth control, contraception, population and cultural demographics
14. Genetics
  - a. Chromosomes, alleles, Punnett squares, dominance / recessive, co-dominance, pleiotropy, multiple alleles, sex-linked traits, genomics, proteionics, bio-medical ethics

### Laboratory or Activity Content

1. Scientific Method
  - a. Classic – observation, hypothesis, test, data / results / conclusion, theory
  - b. Modern – assumption, description / explanation, humility
  - c. Induction / Deduction
2. Histology
  - a. Care of the microscope, function and use
  - b. Epithelium
  - c. Connective
  - d. Muscle
  - e. Neural
  - f. Integument
3. Basic Organic and Inorganic Chemistry



- a. Molecular models
- b. Functional groups, dehydration synthesis and hydrolysis
- 4. Spectrophotometry
  - a. Blood analysis of glucose, protein, cholesterol, and BUN, calibration of equipment
  - b. Diabetes, hypercholesterolemia, hyperproteinemia and anemia
- 5. Metabolism
  - a. Glycolysis, Krebs cycle, electron transport chain, anaerobic respiration and chemiosmosis
- 6. Diffusion
  - a. Osmosis, concentration gradients, weight
  - b. Titration and color indicators
- 7. Muscle Contraction
  - a. Electrical stimulation
  - b. Vasoconstriction, vasodilation, muscle stimulation, anesthesia
- 8. General Senses
  - a. Two point discrimination, somato-sensory fields, sensory adaptation, referred pain and phantom limb phenomenon
- 9. Special Senses
  - a. Olfaction, gustation, vision, acuity, accommodation, after-image, dominance, color-blindness
  - b. Hearing, localization, equilibria, ophthalmoscopic and otoscopic examination
- 10. Endocrine System
  - a. Histologic examination
- 11. Digestion
  - a. Carbohydrate metabolism, IKI and Benedicts test
  - b. Lipid metabolism, pH lithmus paper, water baths
  - c. Protein metabolism, acid – base reactions
  - d. Fat analysis
- 12. Respiration
  - a. Spirometry
  - b. Special topics and disease
- 13. EKG and Hematology
  - a. Application, normal rhythms and arrhythmias
  - b. Hemotocytometer, counts and differentials, agglutination reactions
- 14. Urinalysis
  - a. Specific gravity, color, clarity, constituents, pregnancy, slide preparation
- 15. Reproduction and Genetics
  - a. Monohybrid and dihybrid crosses
  - b. Plietropy
  - c. Sex-linked traits
- 16. Forensics
  - a. Finger-print analysis, blood analysis, fiber analysis, crime-scene analysis, hand-writing analysis, circumstances, alibi, and motives

## Methods of Evaluation

**Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):**

Written expression  
 Problem solving exercises  
 Skills demonstrations

**Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):**

Group projects  
 Individual projects  
 Laboratory reports  
 Objective exams  
 Quizzes  
 Research papers  
 Skills demonstrations  
 Essays  
 Projects  
 Problem-Solving Assignments

## Instructional Methodology

### Specify the methods of instruction that may be employed in this course

Audio-visual presentations  
 Class activities  
 Class discussions  
 Collaborative group work  
 Computer-aided presentations  
 Demonstrations  
 Distance Education  
 Group discussions  
 Guest speakers  
 Internet research  
 Lecture  
 Small group activities

### Describe specific examples of the methods the instructor will use:

1. Instructor-guided interpretation and analysis of topics presented in assigned text readings, such as cell biology, evolution, or biotechnology, anatomical structure and position, histology, organ complexities and inter-connections of organ systems within the organism. Exploration of relationships of comparative physiology and pathologic physiology to better understand normal physiology.
2. In-class group worksheets and activities to enhance understanding of presented topics, such as the cell cycle, anatomical landmarks, directional reference terminology, body cavities, bony arrangement, skeletal muscular naming and actions, neurologic and endocrine regulation of activities of the human organism as well as positional and functional arrangement of organs within each organ system and the interconnections of the organ systems.
3. Animations, video clips, DVDs, slides, virtual activities and models to demonstrate physiologic processes and structures such as cellular organelles, cell reproduction, histology, as well as the integumentary, skeletal, muscular, digestive, respiratory, nervous, cardiovascular, endocrine, lymphatic, urinary and reproductive systems.

## Representative Course Assignments

### Writing Assignments

1. Clinical Issues Report – allows students to organize material from diverse sources, evaluate the appropriateness of different physiologic processes in light of their understanding and develop an opinion to describe their perceptions.
2. Forensics Report – allows students to organize material from diverse sources, evaluate the appropriateness of different physiologic processes in light of their understanding and develop an opinion to describe their perceptions as to the cause of the incident.

### Critical Thinking Assignments

Periodical and internet research paper on efficacy of different treatments of disease in clinical settings. comparing and contrasting theoretical influences in biological organismal and human development. Individual research and peer group review and discussions to evaluate, distinguish and differentiate veracity of ideas for presentation.

### Reading Assignments

1. Handouts – Unit outlines with embedded questions for pre-reading and attempt before lecture presentations. Cellular Metabolism, Connections of the Nervous, Musculoskeletal and Integumentary systems, Nutrition and Healthy Habits, Morbidity and Mortality and Genetics – All presented information is not delineated in textbook and is relevant to students better comprehension of subject matter.

### Skills Demonstrations

Utilization of common medical equipment used in most clinical settings; stethoscope, microscope, blood pressure cuff, EKG, EEG, chemical analysis equipment for blood and urine analysis. Identification of cells, tissues, arrangement and order of organs, their structure and function in detail for preparation of advanced learning for health care certificates and fields.

### Problem-Solving and Other Assignments (if applicable)

1. Genetic problems – allows students to practice making genetic predictions based upon information they have to discern from the information presented.
2. Short videos to enhance student awareness of current medical procedures are presented, as well as topics discussed in lecture.
3. Field trips to hospital operating theaters or visit to the county coroner's office and the morgue to observe an autopsy is frequently made available.

## Outside Assignments

### Representative Outside Assignments

Reading of lecture and lab book, library assignment for preparations of term papers, internet research, evaluation of periodicals, group peer discussions and reviews, memorization of structures listed in unit outlines in preparation for exams.

## Articulation

### C-ID Descriptor Number

BIOL 120B

### Status

Approved

### Comparable Courses within the VCCCD

PHSO V01 - Human Physiology

PHSO M01 - Human Physiology

PHSO M01H - Honors: Human Physiology

## District General Education

### A. Natural Sciences

#### A1. Biological Science

Approved

### B. Social and Behavioral Sciences

### C. Humanities

### D. Language and Rationality

### E. Health and Physical Education/Kinesiology

### F. Ethnic Studies/Gender Studies

### Course is CSU transferable

Yes

### CSU Baccalaureate List effective term:

Fall 2010

## CSU GE-Breadth

### Area A: English Language Communication and Critical Thinking

### Area B: Scientific Inquiry and Quantitative Reasoning

#### B2 Life Science

Approved

#### Effective term:

Fall 2010

#### B3 Laboratory Activity

Approved

#### Effective term:

Fall 2010

**Area C: Arts and Humanities**

**Area D: Social Sciences**

**Area E: Lifelong Learning and Self-Development**

**Area F: Ethnic Studies**

**CSU Graduation Requirement in U.S. History, Constitution and American Ideals:**

**UC TCA**

UC TCA  
Approved

Effective term:  
Fall 2010

**IGETC**

**Area 1: English Communication**

**Area 2A: Mathematical Concepts & Quantitative Reasoning**

**Area 3: Arts and Humanities**

**Area 4: Social and Behavioral Sciences**

**Area 5: Physical and Biological Sciences**

Area 5B: Biological Science  
Approved

Effective term:  
Fall 2010

Area 5C: Laboratory Science  
Approved

Effective term:  
Fall 2010

**Area 6: Languages Other than English (LOTE)**

**Textbooks and Lab Manuals**

Resource Type  
Textbook

Description  
Fox, S. (2019). *Human Physiology* (15th). McGraw-Hill Education, New York. 9781259864629

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Resource Type  
Textbook

Description  
Fox, S. (2019). Laboratory Guide To *Human Physiology* (15th). McGraw-Hill Education, New York. 9780072852981

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Resource Type  
Other Resource Type

**Description**

Handouts – Cellular Metabolism, Connections of the Nervous, Musculoskeletal and Integumentary systems, Morbidity and Mortality and Genetics .

**Resource Type**

Other Resource Type

**Description**

Short Films – Metabolism and Cellular Respiration, Respiratory Physiology – Everest -The Death Zone, Protein Synthesis, Life's Greatest Miracle and A Question of Genes..

**Distance Education Addendum****Definitions****Distance Education Modalities**

Hybrid (1%–50% online)  
Hybrid (51%–99% online)  
100% online

**Faculty Certifications**

**Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.**

Yes

**Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.**

Yes

**Regular Effective/Substantive Contact****Hybrid (1%–50% online) Modality:**

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Canvas portal with assignments of video conferencing, recorded lectures, frequent discussions will be used such as faculty to student interaction via discussion boards as well as student to student peer interaction via discussion boards, video presentations, internet research, email, zoom office hours and online chat. Laboratory activities on campus.
Other DE (e.g., recorded lectures)	Canvas portal with assignments of video conferencing, frequent use of recorded lectures, frequent discussions will be used such as faculty to student interaction via discussion boards as well as student to student peer interaction via discussion boards, video presentations, internet research, email, zoom office hours and online chat. Laboratory activities on campus.
E-mail	Email will be available for student to instructor communications. Canvas portal with assignments of video conferencing, frequent use of recorded lectures, frequent discussions will be used such as faculty to student interaction via discussion boards and student to student peer interaction via discussion boards, video presentations, internet research, email, zoom office hours and online chat. Laboratory activities online through video demonstrations, 3D tutorials as well as instructor led and self-guided laboratory practicums.

**Hybrid (51%–99% online) Modality:**

<b>Method of Instruction</b>	<b>Document typical activities or assignments for each method of instruction</b>
Other DE (e.g., recorded lectures)	Canvas portal with assignments of video conferencing, frequent use of recorded lectures, frequent discussions will be used such as faculty to student interaction via discussion boards as well as student to student peer interaction via discussion boards, video presentations, internet research, email, zoom office hours and online chat. Laboratory activities on campus.
Asynchronous Dialog (e.g., discussion board)	Canvas portal with assignments of video conferencing, recorded lectures, frequent discussions will be used such as faculty to student interaction via discussion boards as well as student to student peer interaction via discussion boards, video presentations, internet research, email, zoom office hours and online chat. Laboratory activities on campus.
E-mail	Email will be available for student to instructor communications. Canvas portal with assignments of video conferencing, frequent use of recorded lectures, frequent discussions will be used such as faculty to student interaction via discussion boards and student to student peer interaction via discussion boards, video presentations, internet research, email, zoom office hours and online chat. Laboratory activities online through video demonstrations, 3D tutorials as well as instructor led and self-guided laboratory practicums.

**100% online Modality:**

<b>Method of Instruction</b>	<b>Document typical activities or assignments for each method of instruction</b>
E-mail	Email will be available for student to instructor communications. Canvas portal with assignments of video conferencing, frequent use of recorded lectures, frequent discussions will be used such as faculty to student interaction via discussion boards and student to student peer interaction via discussion boards, video presentations, internet research, email, zoom office hours and online chat. Laboratory activities online through video demonstrations, 3D tutorials as well as instructor led and self-guided laboratory practicums.
Asynchronous Dialog (e.g., discussion board)	Canvas portal with assignments of video conferencing, recorded lectures, frequent discussions will be used such as faculty to student interaction via discussion boards as well as student to student peer interaction via discussion boards, video presentations, internet research, email, zoom office hours and online chat. Laboratory activities on campus.
Other DE (e.g., recorded lectures)	Canvas portal with assignments of video conferencing, frequent use of recorded lectures, frequent discussions will be used such as faculty to student interaction via discussion boards as well as student to student peer interaction via discussion boards, video presentations, internet research, email, zoom office hours and online chat. Laboratory activities on campus.

**Examinations****Hybrid (1%–50% online) Modality**

On campus  
Online

**Hybrid (51%–99% online) Modality**

On campus  
Online

**Primary Minimum Qualification**

BIOLOGICAL SCIENCES

## Review and Approval Dates

**Department Chair**

05/05/2023

**Dean**

05/08/2023

**Technical Review**

05/10/2023

**Curriculum Committee**

05/10/2023

**DTRW-I**

MM/DD/YYYY

**Curriculum Committee**

MM/DD/YYYY

**Board**

MM/DD/YYYY

**CCCCO**

MM/DD/YYYY

**Control Number**

CCC000523507

**DOE/accreditation approval date**

MM/DD/YYYY