



**CREDIT COURSE OUTLINE**

**I. COVER PAGE**

(1) BIOL 22	(2) HUMAN PHYSIOLOGY	(3) 5
Number	Title	Units

(4) Lecture / Lab Hours:			(8) Classification:		
Total Course Hours					
	Total Lec hours:	4.00	Degree applicable:		X
	Total Lab hours:	3.00	Non-degree applicable:		
	Total Contact hours:	126.00	Basic skills:		
Lec will generate <u>0</u> hour(s) outside work.			(9)RC Fulfills AS/AA degree requirement: (area)		
Lab will generate <u>0</u> hour(s) outside work.			General education category:		
			Area A Natural Sciences		
			Major: BIOLOGICAL SCIENCE		
			Certificate of:		
			Certificate in:		
(5) Grading Basis:	Grading Scale Only		(10)CSU Baccalaureate: X		
	Pass/No Pass option	X	(11)Repeatable: (A course may be repeated three times) 0		
	Pass/No Pass only				
(6) Advisories:					
<i>No defined advisories.</i>					
(7) Pre-requisites(requires C grade or better):					
BIOL 20					
CHEM 1A					
CHEM 3A					
Corequisites:					

(12) Catalog Description:  
 This course provides a basic understanding and working knowledge of the human body with emphasis on the functions of each major system. The interrelationship between human systems and the relationship between structure and function of each system will be studied at several levels (biochemical, cellular, organ levels).

**II. COURSE OUTCOMES:**

*(Specify the learning skills the student demonstrates through completing the course and link critical thinking skills to specific course content and objectives.)*

Upon completion of this course, students will be able to:

- I. describe the function of each human organ and organ system.
- II. explain the cell membrane potential and how it becomes an action potential.
- III. describe the cell-to-cell communication.
- IV. demonstrate the use of the electrocardiograph and identify the components of a normal reading.
- V. describe the interactions of the respiratory and excretory systems.
- VI. demonstrate critical thinking by evaluating homeostasis.

**III. COURSE OBJECTIVES:**

*(Specify major objectives in terms of the observable knowledge and/or skills to be attained.)*

In the process of completing this course, students will:

- I. assess the basic structure and function of each system in the human body.
- II. assess the results of laboratory experiments and demonstrations.
- III. illustrate the cell membrane, its electrical activity and the conduction of action potentials.
- IV. compare the autonomic system and the endocrine system.
- V. analyze the cardiovascular system by performing an EKG and monitoring blood pressure.
- VI. evaluate lung and kidney function using computer simulations.

**IV. COURSE OUTLINE:**

**Lecture Content:**

- A. The Study of Body Functions
- B. Chemical Composition of the Body
- C. Cell Structure and Genetic Control
- D. Enzymes and Energy
- E. Cell Respiration and Metabolism
- F. Interactions Between Cells and the Extra-cellular Environment
- G. The Nervous System: Neurons and Synapses
- H. The Central Nervous System
- I. The Autonomic Nervous System
- J. Sensory Physiology
- K. Endocrine Glands: Secretion and Action of Hormones
- L. Muscle: Mechanisms of Contraction and Neural Control
- M. Heart and Circulation
- N. Cardiac Output, Blood Flow, and Blood Pressure
- O. The Immune System
- P. Respiratory Physiology
- Q. Physiology of the Kidneys
- R. The Digestive System
- S. Regulation of Metabolism
- T. Reproduction

**Lab Content:**

- A. Homeostasis and Negative Feedback
- B. Colorimetry: Measurement of Plasma Glucose, Cholesterol and Protein
- C. Diffusion, Osmosis, and Tonicity
- D. Cell Transport Mechanisms and Permeability
- E. Endocrine System Physiology
- F. Neurophysiology of Nerves
- G. Cutaneous Receptors
- H. Skeletal Muscle Physiology
- I. Cardiovascular Physiology
- J. Cardiovascular Dynamics
- K. EKG Lab
- L. Blood Analysis
- M. Respiratory System Mechanics
- N. Renal System Physiology
- O. Acid/Base Balance
- P. Chemistry and Physiology of Digestion
- Q. Nutrition and BMR
- R. Serological Testing
- S. Immunity

**V. APPROPRIATE READINGS**

*Reading assignments may include but are not limited to the following:*

- I. Sample Text Title:
  - 1. Recommended - Fox *Human Physiology*, ed. 11th McGraw Hill, 2009,

II. Other Readings

- Global or international materials or concepts are appropriately included in this course
- Multicultural materials and concepts are appropriately included in this course

If either line is checked, write a paragraph indicating specifically how global/international and/or multicultural materials and concepts relate to content outline and/or readings.

**VI. METHODS TO MEASURE STUDENT ACHIEVEMENT AND DETERMINE GRADES:**

Students in this course will be graded in at least one of the following four categories. Please check those appropriate. A degree applicable course must have a minimum of one response in category A, B, or C.

<b>A. Writing</b>	
Check either 1 or 2 below	
X	<b>1. Substantial writing assignments are required. Check the appropriate boxes below and provide a written description in the space provided.</b>

	<b>2. Substantial writing assignments are NOT required. If this box is checked leave this section blank. For degree applicable courses you must complete category B and/or C.</b>		
X	a) essay exam(s)		d) written homework
	b) term or other paper(s)		e) reading reports
X	c) laboratory report(s)		f) other (specify)

**Required assignments may include but are not limited to the following:**

Essay questions comprise 25% of each exam score.  
Lab reports consist of several short answer questions.

<b>B. Problem Solving</b>			
Computational or non-computational problem-solving demonstrations, including:			
X	a) exam(s)	X	d) laboratory reports
	b) quizzes		e) field work
	c) homework problems		f) other (specify):

**Required assignments may include but are not limited to the following:**

Beer's Law is used to determine the concentration of test samples.  
Students are required to make a standard curve of blood glucose.  
EKG recordings are assessed in the cardiovascular lab.

<b>C. Skill demonstrations, including:</b>			
X	a) class performance(s)	X	c) performance exams(s)
	b) field work		d) other (specify)

**Required assignments may include but are not limited to the following:**

The students are tested on the use of the spectrophotometer.  
Electrocardiograms are performed on students and are analyzed for lab.  
Several labs are computerized simulations.

<b>D. Objective examinations including:</b>			
X	a) multiple choice	X	d) completion
X	b) true/false	X	e) other (specify):
X	c) matching items		

**COURSE GRADE DETERMINATION:**

Description/Explanation: Based on the categories checked in A-D, it is the recommendation of the department that the instructor's grading methods fall within the following departmental guidelines; however, the final method of grading is still at the discretion of the individual instructor. The instructor's syllabus must reflect the criteria by which the student's grade has been determined. (A minimum of five (5) grades must be recorded on the final roster.)

If several methods to measure student achievement are used, indicate here the approximate weight or percentage each has in determining student final grades.

The final course grade is determined as follows: 60% of grade based on 7 lecture-lab exams 20% of grade based on completed laboratory reports 15% of grade based on final exam 5% of grade based on participation

**VII. EDUCATIONAL MATERIALS**

For degree applicable courses, the adopted texts, as listed in the college bookstore, or instructor-prepared materials have been certified to contain college-level materials.

Validation Language Level (check where applicable):	College-Level Criteria Met	
	YES	NO
Textbook	<u>  X  </u>	<u>      </u>
Reference materials	<u>      </u>	<u>  X  </u>
Instructor-prepared materials	<u>  X  </u>	<u>      </u>
Audio-visual materials	<u>  X  </u>	<u>      </u>

Indicate Method of evaluation:

Used readability formulae (grade level 10 or higher)	<u>  X  </u>
Text is used in a college-level course	<u>  X  </u>
Used grading provided by publisher	<u>      </u>
Other: (please explain; relate to Skills Levels)	<u>      </u>

Computation Level (Eligible for MATH 101 level or higher where applicable)	<u>  X  </u>	<u>      </u>
Content		
Breadth of ideas covered clearly meets college-level learning objectives of this course	<u>  X  </u>	<u>      </u>
Presentation of content and/or exercises/projects:		

Requires a variety of problem-solving strategies including inductive and deductive reasoning.	<u>  X  </u>	<u>      </u>
Requires independent thought and study	<u>  X  </u>	<u>      </u>
Applies transferring knowledge and skills appropriately and efficiently to new situations or problems.	<u>  X  </u>	<u>      </u>

List of Reading/Educational Materials  
 Recommended - Fox *Human Physiology*, ed. 11th McGraw Hill, 2009,

Comments:

       This course requires special or additional library materials (list attached).  
  X   This course requires special facilities:  
 Biology Lab

Attached Files:

**BASIC SKILLS ADVISORIES PAGE** The skills listed are those needed for eligibility for English 125, 126, and Math 101. These skills are listed as the outcomes from English 252, 262, and Math 250. In the right hand column, list at least three major basic skills needed at the beginning of the target course and check off the corresponding basic skills listed at the left.

Check the appropriate spaces.

       Eligibility for Math 101 is advisory for the target course.  
       Eligibility for English 126 is advisory for the target course.  
       Eligibility for English 125 is advisory for the target course.

*If the reviewers determine that an advisory or advisories in Basic Skills are all that are necessary for success in the target course, stop here, provide the required signatures, and forward this form to the department chair, the appropriate associate dean, and the curriculum committee.*

CONTENT REVIEW	
<b>CHEM 3A INTRODUCTORY GENERAL CHEMISTRY</b>	
Construct and balance a chemical reaction and use the reaction to predict stoichiometric quantities.	
Understand acid-base reactions and how to calculate pH.	
Name and draw Lewis diagrams of inorganic and molecular compounds from the formula and vice versa.	
<b>CHEM 1A GENERAL CHEMISTRY</b>	
Collect and analyze data and have reasonable conclusions. Assessed by the lab practical.	
Competent knowledge of the periodic table, molecules, and compounds. Assessed from a pre-test administered at the beginning of the semester and the final exam administered at the end of the semester.	
Ability to apply skills to solve chemical problems especially math skills. Assessed from a pre-test administered at the beginning of the semester and the final exam administered at the end of the semester.	
<b>BIOL 20 HUMAN ANATOMY</b>	

REQUISITES	
<b>Subject Prerequisite -- BIOL 20 HUMAN ANATOMY</b>	
<ul style="list-style-type: none"> <li>• use a microscope to identify tissues and cells</li> <li>• describe functions of the cells and tissues</li> <li>• describe the functions of the body systems</li> <li>• Identify the major body systems macroscopically.</li> <li>• Identify the major body tissue and cell types microscopically.</li> </ul>	<ul style="list-style-type: none"> <li>• assess the basic structure and function of each system in the human body.</li> <li>• analyze the cardiovascular system by performing an EKG and monitoring blood pressure.</li> <li>• evaluate lung and kidney function using computer simulations.</li> </ul>
<b>Subject Prerequisite -- CHEM 1A GENERAL CHEMISTRY</b>	

- Collect and analyze data and have reasonable conclusions. Assessed by the lab practical.
- Competent knowledge of the periodic table, molecules, and compounds. Assessed from a pre-test administered at the beginning of the semester and the final exam administered at the end of the semester.
- Ability to apply skills to solve chemical problems especially math skills. Assessed from a pre-test administered at the beginning of the semester and the final exam administered at the end of the semester.

- assess the basic structure and function of each system in the human body.
- illustrate the cell membrane, its electrical activity and the conduction of action potentials.
- analyze the cardiovascular system by performing an EKG and monitoring blood pressure.

**Subject Prerequisite -- CHEM 3A INTRODUCTORY GENERAL CHEMISTRY**

- Use dimensional analysis to solve for an unknown parameter of density, volume, mass, pressure, temperature, molar mass, concentration, or an empirical formula.
- Understand acid-base reactions and how to calculate pH.
- Safely conduct laboratory experiments implementing concepts and principles learned in lecture.

- assess the basic structure and function of each system in the human body.
- assess the results of laboratory experiments and demonstrations.
- illustrate the cell membrane, its electrical activity and the conduction of action potentials.

**ESTABLISHING PREREQUISITES OR COREQUISITES**

Every prerequisite or corequisite requires content review plus justification of at least one of the seven kinds below. Prerequisite courses in communication and math outside of their disciplines require justification through statistical evidence. Kinds of justification that may establish a prerequisite are listed below.

Check one of the following that apply. Documentation may be attached.

1. \_\_\_ The prerequisite/corequisite is required by law or government regulations.  
Explain or cite regulation numbers:
2. \_\_\_ The health or safety of the students in this course requires the prerequisite.  
Justification: Indicate how this is so.
3. \_\_\_ The safety or equipment operation skills learned in the prerequisite course are required for the successful or safe completion of this course.  
Justification: Indicate how this is so.
4. \_\_\_ The prerequisite is required in order for the course to be accepted for transfer to the UC or CSU systems.  
Justification: Indicate how this is so.
5. \_\_\_ Significant statistical evidence indicates that the absence of the prerequisite course is related to unsatisfactory performance in the target course.  
Justification: Cite the statistical evidence from the research.
6. X The prerequisite course is part of a sequence of courses within or across a discipline.  
Biol 20
7. X Three CSU/UC campuses require an equivalent prerequisite or corequisite for a course equivalent to the target course:  
Chem 3A Chem 1A