



CREDIT COURSE OUTLINE

I. COVER PAGE

(1) BIOL 1	(2) PRINCIPLES OF BIOLOGY	(3) 4
Number	Title	Units

(4) Lecture / Lab Hours:	(8) Classification:	
Total Course Hours		
Total Lec hours: 3.00	Degree applicable:	X
Total Lab hours: 2.00	Non-degree applicable:	
Total Contact hours: 90.00	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:	
(5) Grading Basis:	Grading Scale Only	X
	Pass/No Pass option	
	Pass/No Pass only	
(6) Advisories:	Area A Natural Sciences	
Eligibility for Math 101	Major:	BIOLOGICAL SCIENCE
Eligibility for English 126	Certificate of:	
Eligibility for English 125	Certificate in:	
(7) Pre-requisites (requires C grade or better):	(10) CSU	Baccalaureate: X
MATH 103	(11) Repeatable: (A course may be repeated three times)	0
Corequisites:		

(12) Catalog Description:
 This course is recommended for the pre-professional and life science majors. It fulfills the prerequisite for Biology 20, Biol-31, Biology 4, and Biology 6 (suggested for students with weak biology preparation who intend to take Biol-11A). Topics covered include the cellular and chemical basis of life, organ systems, genetics, evolution and the origin of life, ecology and environmental concerns.

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. evaluate comparative anatomy and physiology in living organisms. This applies to the normal vs. abnormal anatomy and physiology as well as comparing totally different organisms.
- II. understand scientific method and be able to apply the process to any situation that needs evaluation and recommendations. For example: the pre-nursing students are learning how to approach each patient and the evaluative process.
- III. use inductive and deductive reasoning in any environmental or ecological issue.

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. identify life from an evolutionary approach, from basic organic molecules to whole organ systems.
- II. evaluate the biological sciences through references to historical discoveries and contributions which have led to the current use of scientific methods.
- III. use scientific methods in performing experiments and collecting data.
- IV. apply the classical principles of Mendelian genetics to understand DNA as hereditary material and the application to evolutionary thought.
- V. understand chemical and energy relationships of the levels of biological organization.
- VI. compare and contrast functional systems of living organisms.
- VII. identify environmental and ecological issues.
- VIII. evaluate scientific literature and current biological advances.

IV. COURSE OUTLINE:

Lecture Content:

A. Section I – Lecture and Lab exams will follow at the end of 5 weeks(in the 6th week)

1. Introduction: What is Life?
 - a. Darwin and the meaning of Life
 - b. Scientific Method
2. Cell Theory and Cell Morphology
 - a. Prokaryotic vs Eukaryotic Cells
 - b. Cell Nucleus and Cell Division: Mitosis
 - c. Meiosis: Spermatogenesis and Oogenesis
3. Molecules of Life
 - a. Atoms and Atomic Structure
 - b. Molecular Bonding
 - c. Sponch, water, and pH (acids and bases)
4. Plasma Membrane Structure
 - a. Transport Across the membrane: Passive and Active
 - b. The effects of Hypertonic, Hypotonic, and Isotonic solutions.
 - c. Define extracellular fluids.
5. What Is Energy?
 - a. The Laws of Thermodynamics: How do they affect Life?
 - b. The Application of Energy Principles to the chemistry of Life.
 - c. Biochemical reactions and Enzymes.

B. Section 2 – Lecture and Lab exams will follow at the end of 5 weeks (in the 12th week)

1. Digestion and Nutrition
 - a. Anatomical Structures of Digestion
 - b. Chemistry of Digestion
 - c. Essentials of Nutrition
 - d. Comparative Digestive Systems: Invertebrate, Vertebrate, and Human Digestive Systems
2. Cellular Respiration and Photosynthesis
 - a. Glycolysis?Krebs?Electron Transport Chain
 - b. Photosynthesis: Light and Dark Reactions
3. Circulatory System
 - a. Internal and External Blood Vessels]
 - b. Physiology and Control of Circulaton
 - c. Anatomy of Blood Vessels and the Heart
 - d. Components of the Blood Clotting Mechanism and Blood
 - e. Fetal Circulation
 - f. Lymphatic system
4. Plant Growth and Structure
 - a. Plant tissues: root, stem, and leaf
 - b. Plant transport mechanisms
 - c. Transport of Food
5. Classificaton and Systematics
 - a. Plant Evolution and Diversity
 - b. Major Plant Divisions
 - c. Plant Regulation and Response
 - d. Plant Hormones

C. Section 3 – Lecture and Lab exam will follow at the end of 5 weeks (in the 18th week)

1. Osmoregulation and Excretion/ and Reproduction
 - a. Kidney Anatomy and Physiology
 - b. Reproduction in Animals
 - c. Human Female and Male Anatomy and Physiology
 - d. Pregnancy and Birth
2. Genetics:
 - a. History
 - b. Mendelian Genetics
 - c. Mutations
 - d. Inheritance of Sickle Cell Anemia
 - e. Blood Groups
 - f. X-linked Traits
3. Genetics II
 - a. Dominance, Multiple Alleles, and Gene Expression
 - b. Sex Determination
 - c. DNA as genetic material
 - d. Replicaion
 - e. Genetic Engineering
4. Animal Development and the Nervous System
 - a. Gastrulation, Organogenesis, and Differentiation
 - b. Neurons, Nerve Impulses, and a Synapse
 - c. Brain and Spinal Cord
 - d. Peripheral and Autonomic Nervous Systems
 - e. Sensory Receptors

- f. Endocrinology
- 5. Natural Selection and Adaptation
 - a. Examples: Finch Experiments
 - b. Global Changes in Darwinian Evolution

Lab Content:

The lab content was included in the lecture content section.

V. APPROPRIATE READINGS

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

- I. Sample Text Title:
 - or
 - 1. Recommended - Mader *Biology (Custom Version)*, ed. 10th or newer McGraw-Hill, 2010,
 - or
 - 2. Recommended - Starr, Taggart, Evers, & Star *Biology: The Unity and Diversity of Life*, ed. 12 Brooks/Cole (Cengage), 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.

Biol-1 is a GE biology course and as such ecology is included in the curriculum. Ecology is the study of the interaction between the living and their environment which requires a global view point to understand ecology. Therefore, a global view is interwoven throughout the course.

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.

A. Writing			
Check either 1 or 2 below			
<input checked="" type="checkbox"/>	1. Substantial writing assignments are required. Check the appropriate boxes below and provide a written description in the space provided.		
<input type="checkbox"/>	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.		
<input checked="" type="checkbox"/>	a) essay exam(s)	<input checked="" type="checkbox"/>	d) written homework
<input checked="" type="checkbox"/>	b) term or other paper(s)	<input checked="" type="checkbox"/>	e) reading reports
<input checked="" type="checkbox"/>	c) laboratory report(s)	<input checked="" type="checkbox"/>	f) other (specify)

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

Examples:

- 1. diagram meiosis and mitosis giving the specific arrangement of DNA.
- 2. read an article about Photosynthesis and summarize in one page.
- 3. answer questions on the digestive tract and discuss normal vs abnormal function.
- 4. after completing the chemistry lab, please discuss the importance of the four macromolecules of life.

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

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

- 1. convert a 160 pounds into metric units.
- 2. given the function of smooth ER, what is its role in lipid metabolism.
- 3. what is the longhand form of a dilution is 1×10^{-6} ?
- 4. in our chemistry lab, what is the meaning of an orange color in the Benedicts Test?

C. Skill demonstrations, including:			
<input checked="" type="checkbox"/>	a) class performance(s)	<input checked="" type="checkbox"/>	c) performance exams(s)

<input type="checkbox"/>	b) field work	<input type="checkbox"/>	d) other (specify)
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Required assignments may include but are not limited to the following:

1. fetal Pig Dissection and identification of the digestive system.
2. use of a microscope: optics, field of vision, and measurement.
3. microscopic examination of plants slides and the identification of roots, stems, and leaves.
4. an experiment involving feeding congo red –stained yeast cells to unicellular Paramecium so students may observe, discuss, and write about the processes involved including phagocytosis, pH changes during digestion, and osmoregulation as the Paramecium undergoes the digestive process.

D. Objective examinations including:			
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 break down listed is a suggestion that may/should be adjusted by each instructor. 3 Lecture Exams (200 points each) = 600 3 Lab Exams (100 points each) = 300 Term Paper = 200 Lab Reports, Quizzes, etc. = 300 Total Points = 1400

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> X </u>	<u> </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> </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>

<i>Computation Level</i> (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 - Mader *Biology (Custom Version)*, ed. 10th or newer McGraw-Hill, 2010,
 Recommended - Starr, Taggart, Evers, & Star *Biology: The Unity and Diversity of Life*, ed. 12 Brooks/Cole (Cengage), 2009,

Comments:

This course requires special or additional library materials (list attached).
 This course requires special facilities:
 Biology Teaching Lab Standard Lecture room, possibly LGI for double or triple lecture sections.

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.

(eligibility for Math 101)
(as outcomes for Math 250)

Performing the four arithmetic operations on whole numbers, arithmetic fractions, and decimal fractions.

Making the conversions from arithmetic fractions to decimal fractions, from decimal fractions to percents, and then reversing the process.

Applying the concepts listed above to proportions, percents, simple interest, markup and discount.

Applying the operations of integers in solving simple equations.

Converting between the metric and English measurement systems

1. Fractions, Ratios, and Equivalent Equations
2. Per cents
3. Exponents
4. Chemical measurements in the metric and English systems

(eligibility for English 126)
(as outcomes for English 262)

Using phonetic, structural, contextual, and dictionary skills to attack and understand words.

Applying word analysis skills to reading in context.

Using adequate basic functional vocabulary skills.

Using textbook study skills and outlining skills.

Using a full range of literal comprehension skills and basic analytical skills such as predicting, inferring, concluding, and evaluating.

1. Ability to read a college level text.
2. Ability to read biological terminology.
3. Ability to outline for lecture and lab.
4. Ability to read and understand examples and case studies.

(eligibility for English 125)
(as outcomes for English 252)

Writing complete English sentences and avoiding errors most of the time.

Using the conventions of English writing: capitalization, punctuation, spelling, etc.

Using verbs correctly in present, past, future, and present perfect tenses, and using the correct forms of common irregular verbs.

Expanding and developing basic sentence structure with appropriate modification.

Combining sentences using coordination, subordination, and phrases.

Expressing the writer's ideas in short personal papers utilizing the writing process in their development.

1. Ability to write out lab reports.
2. Ability to answer essay questions on exams.
3. Ability to answer critical thinking questions in an organized, grammatically correct format.

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

MATH 103 INTERMEDIATE ALGEBRA

REQUISITES

Subject Prerequisite -- MATH 103 INTERMEDIATE ALGEBRA

- Simplify and/or factor mathematical expressions into forms more conducive to analysis.
- Solve equations introduced in Intermediate Algebra.
- Graph functions and relations introduced in Intermediate Algebra.
- Apply Intermediate Algebra topics to solve real-life problems.

- understand chemical and energy relationships of the levels of biological organization.
- use scientific methods in performing experiments and collecting data.
- evaluate scientific literature and current biological advances.

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.
The UC system mandated the Math 103 course as a prerequisite for Biol-1 to transfer.
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. The prerequisite course is part of a sequence of courses within or across a discipline.
7. Three CSU/UC campuses require an equivalent prerequisite or corequisite for a course equivalent to the target course: