

CATALOG INFORMATION

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Dept & Nbr: BIO 250 Title: PRINCIPLES OF BIOLOGY

Full Title: Principles of Biology

Units	Course Hours	Per Week	Nbr of Weeks	Course Hours	Total
Max: 5.0	Lecture	4.0	17	Lecture	68.0
Min: 5.0	Lab	3.0		Lab	51.0
	Contact DHR	0.0		Contact DHR	0.0
	Contact Total	7.0		Contact Total	119.0
	Non-contact DHR	0.0		Non-contact DHR	0.0

Title 5 Category: 01 AA Degree Applic  
Grading: GC Credit course for grade or CR/NC  
Repeatability: 00 No repeatability allowed or defined  
Also listed as:

CATALOG DESCRIPTION:

Fundamental principles of biology with emphasis on the molecular and cellular levels. For biological science majors and students in pre-professional programs.

PREREQUISITES:

Completion of MTH 56 (or MTH 120).

RECOMMENDED PREPARATION:

Completion of CHM 250.

LIMITS ON ENROLLMENT:

SCHEDULE OF CLASSES INFORMATION:

Prerequisites: Completion of MTH 56 (or MTH 120).

Recommended: Completion of CHM 250.

Biology majors, health professionals and general interest students will learn about the structure and function of common life forms and study factors which influence their abundance and distribution on earth. (Grade or CR/NC)

Transfer Credit: CSU; UC. (CAN BIOL 2)

ARTICULATION and CERTIFICATE INFORMATION

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ASSOCIATE DEGREE:		Effective: FALL	1981	Inactive:
Area:	A	NATURAL SCIENCES		
CSU GE:		Effective: FALL	1981	Inactive:
Transfer area:	B2	LIFE SCIENCE		
	B3	LAB ACTIVITY		

IGETC: Effective: FALL 1981 Inactive:  
 Transfer area: 5B BIOLOGICAL SCIENCES

CSU TRANSFER: TRANSFERABLE Effective: FALL 1981 Inactive:

UC TRANSFER: TRANSFERABLE Effective: FALL 1981 Inactive:

CAN:  
 BIOL 2 Grp Nbr: 01 Effective: SPRING 1989 Inactive:

CERTIFICATE APPLICABLE: N NOT CERTIFICATE/MAJOR APPLICABLE

#### APPROVAL AND DATES

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Version 02 Submitted by: ALAN WEST Date: 04/27/2005  
 Department approved: Date:  
 Curriculum approved: 06/01/1981 Version approved: 04/22/2005  
 Prerequisites approved: 10/02/2000 Last reviewed: 04/22/2005  
 Term effective: SPRING 2006 Last taught: FALL 2007 Inactive:

#### COURSE CONTENT

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##### OUTCOME AND OBJECTIVES:

1. Identify organisms of importance that are studied in laboratory and field situations.
2. Develop an understanding of the anatomy and physiology of selected organisms and the consequential effect of various environmental factors upon them.
3. Know the major groups of organic molecules and their functions.
4. Understand major metabolic processes, e.g., photosynthesis, cellular respiration, gas exchange and protein synthesis.
5. Develop the fundamental laboratory skills that are essential to further study.

##### TOPICS AND SCOPE:

###### Lecture:

Introduction  
 Biological Chemistry  
 Chemical Principals  
 Carbohydrates, Lipids, Proteins, DNA  
 Amino Acids  
 Cell Structure  
 Size restrictions  
 Plant vs. Animal  
 Organelles  
 Plasma Membrane  
 Nucleus  
 Endoplasmic Reticulum (ER)  
 Golgi, Lysosomes, Chloroplasts, Mitochondria  
 Cilia, Flagella  
 Cell Functions  
 Cell Transport  
 Passive  
 Active

- Cell Division
  - DNA Replication and Chromosomes
  - Mitosis
  - Meiosis
- Protein Synthesis
- Photosynthesis
  - Photosystem I and II
  - Chloroplast, Thylakoid
  - Visible spectrum
  - Light Dependent/Independent, Nonycltic/Cyclic
  - Clavin Cycle
  - C4
- Glycolysis and Cellular Respiration
- Nutrient Uptake (Plants)
  - Root Structure
  - Root Function
    - Water Absorption/Movement
    - Mineral Absorption
- Digestion (Animals)
  - Enzymes
  - Invertebrates/vertebrates/ruminates/humans
  - Dentition
  - Digestive Organs
    - Stomach
    - Intestine, Pancreas, Liver
  - Substance Digestion
    - Carbohydrate, Fat, Protein
  - Nutrition
    - Cholesterol, Vitamins, Minerals
- Internal Transport
  - Plants
    - Vascular Tissue - Structure
    - Vascular Tissue - Function
    - TACT
  - Animal
    - Closed/Open Circulatory Systems
    - Worms
    - Insects
    - Amphibians
    - Fish
    - Birds
    - Humans
- Gas Exchange Systems
  - Plants
    - Leaf Structure/Stomata
  - Animal
    - Diffusion
    - Skin, Gill, Tracheal
    - Lung - Fish, Human
      - Pharynx, Larynx, Trachea, Bronchi, Bronchioles
      - Alveoli - Structure
      - Alveoli - Function
      - Chemistry of Gas Exchange

- Voluntary/Involuntary Respiration
- Stimulus/Response
  - Plants
    - Hormones
    - Tropisms
    - Photoperiodism
  - Animals
    - Neurons/Nerves
    - Reflex Arc
    - Resting/Action Potential
    - Synapses
- Nervous System
  - Structure
  - Activity
  - Autonomic
- Sensory Receptors
  - Thermo-/Chemo-
  - Mechano-
    - Touch/Pressure
    - Auditory
    - Visual
- Support Systems
  - Plants
    - Primary/Secondary growth
    - Secondary Growth - Shoot
    - Collenchyma, Petiole
  - Animals
    - Tissues: Epithelial, Connective, Muscle, Nervous
    - Bones, Skeletal system
- Movement
  - Plants
    - Thigmotropism
  - Animals
    - Contractile systems/Muscle types
    - Contraction control
    - Cell Division
- Plants
  - Reproduction
    - Flower Anatomy
    - Pollination, Fertilization
  - Development
    - Embryo, Seed
    - Seeding
    - Primary growth, Apical meristem
- Animals
  - Reproduction
    - Asexual
    - Sexual
      - Internal/External Fertilization
      - Genetic Variability
      - Human Male/Female
      - Hormones, Menstruation
      - Contraception

- STDs
- Development
  - Gametes
  - Fertilization
  - Early development
  - Trimesters
  - Birth, Aging, Analysis of Development
- Organic Evolution
- Genetics
  - Mendel's first law
  - Mendel's second law
  - Gene Linkage/Recombination
  - Sex Linkage
  - Dominance
  - Phenotype/Genotype variability
- DNA
  - Transformation
  - Structure, Chemistry
  - Replication
- Expression
  - RNA, Transcription
  - Initiation, Translation, Elongation, Termination
  - Gene control, Operons
- Engineering
- Mutations, Anomalies
  - Substitutions, Insertions, Deletions
  - Chromosomal
- Taxonomy and Systemics/Diversity
  - plants-seaweeds, bryophytes, seed plants
  - fungi
  - metazoa-major phyla
- Evolution
  - Charles Darwin
  - fossil record/evidence for evolution
  - macro/micro-evolution
  - speciation
- Ecology
  - Homeostasis
  - Interaction
  - population
  - energy flow, food webs, trophic systems
  - community structure
  - competition
  - diversity and succession
  - global stability, dynamic change
- Laboratory
  1. Cells
  2. Tissues
  3. Osmosis/Diffusion
  4. Aquatic Microorganisms
  5. Mitosis
  6. Meiosis
  7. Major Taxonomy

8. Plant Anatomy
9. Animal Anatomy
10. Embryology
11. Plant Communities
12. Intertidal Communities
13. Science Seminar
14. Electrophoresis of Proteins and DNA

## ASSIGNMENTS:

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## READING ASSIGNMENTS:

Students will be required to read and study the assigned chapters in the textbook as well as selected reading from journal articles. Examples of appropriate recommended reading: Scientific American and Science.

## WRITING ASSIGNMENTS:

Students are required to investigate and complete selected laboratory reports which are submitted to the instructor at the end of each week. In addition, students are required to research and write a ten-page semester term paper on a current biological topic. Finally, students are required to successfully complete lecture essay exams.

## OUTSIDE ASSIGNMENTS:

Eight hours of independent work must be completed outside of class each week. This work includes studying lecture discussions, reviewing and writing laboratory reports, answering questions presented in the textbook, and preparing for upcoming laboratory assignments.

## ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING:

The experimental laboratory by its very nature requires critical thinking on the part of the student. Students must analyze laboratory results and demonstrate their understanding by interpreting the results in well-written laboratory reports

## METHOD OF INSTRUCTION:

Lecture, laboratory assignments, field trips, slide presentations, handouts, reading assignments, laboratory skill demonstrations and class demonstration.

## METHODS OF EVALUATION:

1. Total grade for the semester will be comprised of 1/2 for the laboratory and 1/2 for the lecture. 2. The lecture grade will be based on at least four exams plus the final with the total score being the cumulative total of each score. Relative weighting of each exam is accomplished by the number of questions varying according to the amount of material covered. 3. The laboratory grade will be based on at least two laboratory exams, one term paper oral presentation, and at least five written laboratory reports.

## BASIS FOR GRADING:

The assignment of a grade is based on the level of achievement of the outcomes and objectives of the course outline and is reflected in quantifiable terms in the course syllabus.

## REPRESENTATIVE TEXTBOOKS:

Lecture: Biology: Science of Life, Wallace et al.  
Laboratory: Handouts provided by the instructor

## REASON FOR REVISION

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## RESOURCES REQUIRED

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## MISCELLANEOUS

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Advisory generate desc:	Y	YES
Area department:	BIO	BIOLOGICAL SCIENCES
Audit flag:	N	NOT AUDITABLE
Basic skills:	X	NOT BASIC SKILLS
Classification:	A	Liberal Arts and Sciences
Cost level:	01	
Disciplines:		BIOLOGICAL SCIENCES
Division:	02	MERIDITH RANDALL
Faculty service areas:		BIOLOGY
Fee:	\$0.00	
In-service:	X	NOT IN-SERVICE
Level below transfer:	X	NOT APPLICABLE
Matric-requiring:	X	Exempt from assessment
Maximum class size:	0	
Maximum wait list:	0	
Method of instruction:	03	LECTURE/LABORATORY
Non-credit category:	X	NOT APPLICABLE, CREDIT COURSE
Open entry/exit:	N	Not open entry/exit
Pacs activity:	0401	BIOLOGY GENERAL
Pacs program project:	0000	
Preq/coreq generate desc:	Y	YES
Preq/coreq provisional:	N	NO
Preq/coreq reg check:	Y	PREREQUISITE RULES EXIST
Repeat group id:		
Requires instructor sig:	N	INSTRUCTOR'S SIGNATURE NOT REQUIRED
SAM classification:	E	Non-occupational
Selected/special topic:	N	NOT A SELECTED TOPIC COURSE
Special class:	X	NOT A SPECIAL COURSE
TOP code:	0401.00	BIOLOGY, GENERAL
Workload:	0.0000	