PALOMAR COLLEGE
COURSE OUTLINE OF RECORD FOR
DEGREE CREDIT COURSE

X Transfer Course X A.A. Degree applicable course
(check all that apply)

COURSE NUMBER AND TITLE: BIOL 106-Biology with a Human Emphasis (Lecture)

UNIT VALUE: 3 units

MINIMUM NUMBER OF SEMESTER HOURS: 48

BASIC SKILLS REQUIREMENTS: Appropriate language and computational skills

ENTRANCE REQUIREMENTS: none

PREREQUISITE:

COREQUISITE:

RECOMMENDED PREPARATION:

SCOPE OF COURSE:
Principles of cellular, organismal and population biology as exemplified by, and relating to, the human organism. *Not open to students with prior credit in BIOL 105.* CSU; UC*

SPECIFIC COURSE OBJECTIVES:
Upon completion of this course, a successful student will be able to:

1. Identify the structural and functional components of a eukaryotic cell;
2. Explain cellular metabolism as it relates to the human system;
3. Compare and contrast mitosis and meiosis;
4. Explain genetic principles as they relate to the human system;
5. Identify tissues, organs and organ systems associated with the human system;
6. Compare and contrast the major organ systems in the human system;
7. Explain evolution as it relates to human systems;
8. Explain the impact of human systems on ecosystems.

CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:

I. Introduction
- A. Characteristics of Living Things
- B. Homeostasis and Feedback Mechanisms

II. Chemistry
- A. Atomic Structure: Subatomic Particles, Electron Shells
- B. Chemical Bonding: Covalent, Ionic, Hydrogen bonds
- C. Biologically Important Compounds and Molecules
  1. Properties of Water
  2. Acids, Bases, Buffers
  3. Macromolecule Structure and Function: Carbohydrates, Lipids, Proteins, Nucleic Acids

III. Cell Biology
- A. Comparison of Prokaryotic and Eukaryotic Cell Structures
- B. Eukaryotic Cell Structure
  1. Functions of Organelles
     - a. Nucleus
     - b. Lysosome
     - c. Cytoskeleton
     - d. Ribosome
     - e. Golgi Complex
     - f. Endoplasmic Reticulum
     - g. Peroxisome
     - h. Mitochondrion
     - i. Centriole
     - j. Chloroplast
     - k. Cilium/Flagellum
  2. Membrane Structure and Function
  3. Movement Across Membranes
     - a. Diffusion/Osmosis
     - b. Facilitated Diffusion
     - c. Active Transport
     - d. Endocytosis and Exocytosis
- C. Energy Conversion in Eukaryotic Cells
  1. Laws of Thermodynamics
  2. Energy Flow
     - a. Photosynthesis: Overview of Reactants, Products, Structures
     - b. Cell Respiration: Structures, Reactants and Products
       1. Anaerobic Respiration
       2. Aerobic Respiration

IV. Genetics: Heredity
- A. Mendel's Laws and Modern Genetic Terminology
- B. Monohybrid Crosses and Dihybrid Crosses
- C. Patterns of Inheritance
  1. Dominant/Recessive
  2. Sex-linked
  3. Incomplete Dominance
  4. Co-dominance
  5. Polygenic Inheritance
  6. Multiple Alleles
- D. The genetics of ABO and Rh Blood Groups

V. Genetics: Molecular
   A. Structure and Replication of DNA
   B. Structure of RNA
   C. Protein Synthesis: Transcription and Translation

VI. Major Organ Systems.

Instructors will discuss ***three major organs systems***. One of the three will be the cardiovascular system. The other two will be chosen from the following list: nervous system; muscle; respiratory system; endocrine system; excretory system; and immune system. Below is the scope of the material to be covered for a given system.

   A. Cardiovascular System
      1. Components of Blood
      2. Structure of Heart
      3. Characteristics of Circulatory Vessels
      4. Cardiac Cycle: systole and diastole; electrical events
      5. Cardiac Output: heart rate and stroke volume
   B. Nervous System
      1. Divisions of Nervous System
      2. Structure of Neuron
      3. Nerve Impulse: action potentials, synaptic events
   C. Muscles
      1. Types of Muscle: skeletal, smooth, cardiac
      2. Gross and Microscopic Skeletal Muscle Anatomy
      3. Sliding Filament Theory of Muscle Contraction
      4. Gross Muscle Contraction
   D. Respiratory System
      1. Anatomy of Respiratory Tract
      2. Muscle Contraction/Relaxation Events of Ventilation
      3. Pressure Changes During Ventilation
      4. Gas Exchange
      5. Oxygen and Carbon Dioxide Transport in Blood
   E. Endocrine System
      1. Basic Endocrine System: Glands, Hormones, Hormone Action
      2. Hypothalamic and Pituitary Actions - Feedback Mechanisms
      3. Effect of Hormones on Cell Activity
   F. Excretory System
      1. Structures of Urinary Tract
      2. Functions of Nephron
         Blood Filtration; Blood Volume: Blood pH
   G. Immune System
      1. Nonspecific Immune Responses
      2. Specific Immune Response: T-lymphocytes; B-lymphocytes
      3. Microorganisms and Disease

VII. Evolution
   A. Principles of Natural Selection
   B. Evidence for Evolution

VIII. Ecology and Human Populations
   A. Population Dynamics
   B. Human Population Growth
   C. Effects of Human Population on Ecosystems

REQUIRED READING:
Instructor choice of:

Campbell, Neil A., Lawrence G. Mitchell, and Jane B. Reece. Biology: Concepts and Connections, latest edition. Redwood City, CA: Benjamin Cummings.
Or
Campbell, Neil A., and Jane B. Reece. Essential Biology. San Francisco, CA: Benjamin Cummings, latest edition,.
Or
Krogh, David. Biology: A Guide to the Natural World. Upper Saddle River, NJ: Prentice Hall, latest edition.
Or
Starr, Cecie. Biology: A Human Emphasis. Belmont, CA: Wadsworth Publishing Co., latest edition.

SUGGESTED READING: none

REQUIRED WRITING:
Exams includes some essay questions with each answer requiring one-half to one full page of writing. Other writing assignments may include short essays on specific topics, journal article reviews, and/or a term paper. These assignments will total a minimum of ten pages of writing.

OUTSIDE ASSIGNMENTS:

Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.

INSTRUCTIONAL METHODOLOGY:

Check all that apply:
_X_ lecture
_____ laboratory
_____ lecture-laboratory combination
_____ directed study

DISTANCE LEARNING:

This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.
Yes ____ No_X_

If yes, check all that apply:

_____ Television Course (Video one-way, e.g. ITV, video cassette, etc.)
_____ Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
_____ Two-Way Video Conferencing (Two-way interactive video and audio)
_____ One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
_____ Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

GRADING POLICY AND STANDARDS
The students will be evaluated on both lecture and reading assignments. Approximately 90% of the grade will be based on exams and quizzes with the remainder from other assignments such as research papers.

IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?
Yes ____ No X Number of times course may be taken for credit: 1

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable:

CONTACT PERSON: Sara Thompson, x2533

SIGNATURES ON FILE