San Bernardino Valley College
Curriculum Approved: SP01

I. CATALOG DESCRIPTION:

A. Division: Science
Department: Biology
Course ID: BIOL 108
Course Title: Molecules to Mammals
Units: 3
Lecture: 3 hours
Prerequisite: None.

B. Course Description:

An introductory course for non-majors interested in investigating the origins and development of life on earth including major lines of evidence for evolution (biogeography, paleontology, and comparative anatomy and physiology); sources of genetic variation; and mechanisms of natural selection and adaptation.

Schedule Description:

Introductory course primarily for non-majors exploring the history of life on earth, its evolution from the origin of the planet to today, including major lines of evidence for evolution, sources of genetic variation; and mechanisms of natural selection and adaptation.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT : One.

III. EXPECTED OUTCOMES FOR STUDENTS:

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

A. Read, critically evaluate, and discuss scientific and popular literature on topics relating to the history of life on Earth.
B. Describe and evaluate the scientific evidence for the evolution of life.
C. Interpret biological phylogenies.
D. Recognize the factors that can influence life on Earth and explain how they have affected life in the past.
E. Identify the major geological time periods of Earth.
F. Describe the major trends in the history of life on Earth.
G. Explain and apply evolutionary theory to life history events.
H. Discuss the importance of knowledge about the past on modern human society.

IV. CONTENT:

A. How scientists understand the history of life
    1. Scientific methods
    2. Evolution
    3. Phylogenies
    4. Paleoclimate & geology

B. The early Earth
    1. Early Earth conditions
    2. Origin of life
    3. Origin of eukaryotes
    4. Origin of multicellularity

C. The early Paleozoic
    1. The Cambrian revolution
    2. The first vertebrates
    3. Plants invade the land
    4. The radiation of fish
    5. Evolution of amphibians

D. The late Paleozoic
    1. Evolution of seed plants
    2. Evolution of reptiles
    3. Reptiles & thermoregulation

E. The Mesozoic
    1. Triassic reptiles
    2. Evolution of mammals
    3. Dinosaur ecology
    4. Evolution of flight
    5. Marine reptiles
    6. Flowers & insects
    7. Extinction

F. The Cenozoic
    1. Mammalian radiations
    2. Mammals & geography
    3. Whale evolution
    4. Primate evolution
    5. Early man
    6. Man and the past

V. METHODS OF INSTRUCTION:

A. Lecture supported by audio-visual aids and biological/fossil demonstration materials
B. Directed discussions
C. Textbook and journal readings
D. Library and/or field research
E. Essays or research paper
F. Student individual and/or small group presentations

VI. TYPICAL ASSIGNMENTS:

A. Using an article from the scientific literature, write an essay discussing how a new paleontological discovery has changed our understanding of the past.

B. Volunteer to prepare fossil material at the San Bernardino County Museum or similar facility and describe in an essay what you learned from the experience.

C. Visit a Natural History Museum with displays and interpretations of fossils. Write an essay describing what you have learned and its impact on our understanding of the past.

VII. EVALUATION:

A. Methods of Evaluation
   1. Short answer and essay exams.
      a. Sample Essay Question: Discuss how the seed and the amniotic egg are comparable structures. What was the importance of these to the future history of plants and vertebrates?
      b. Sample Essay Question: Cyanobacteria have played a major role in the evolution of life on Earth. Explain how they have affected life and continue to affect you even today.
   2. Student papers, presentations and fieldwork.
      a. the clarity of the presentation
      b. creative analysis of the topic and the scientific methology involved
      c. the impact of the topic on the student's life

VIII. TYPICAL TEXTS:

A. Cowen, R. History of Life. Blackwell Scientific Publications, 1995.
B. Volpe, E. Peter and Peter A. Rosenbaum. Understanding Evolution. McGraw Hill, 2000.
C. Price, Peter W. Biological Evolution. Harcourt College Publishers, 1999.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS: None