

**College of San Mateo**  
**Official Course Outline**

1. **COURSE ID:** PALN 110    **TITLE:** General Paleontology  
**Semester Units/Hours:** 3.0 units; a minimum of 48.0 lecture hours/semester  
**Method of Grading:** Letter Grade Only  
**Recommended Preparation:**  
    Eligibility for ENGL 838 or 848.
  
2. **COURSE DESIGNATION:**  
**Degree Credit**  
**Transfer credit:** CSU; UC  
**AA/AS Degree Requirements:**  
    CSM - GENERAL EDUCATION REQUIREMENTS: E5a. Natural Science  
**CSU GE:**  
    CSU GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B1 - Physical Science  
    CSU GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B2 - Life Science  
**IGETC:**  
    IGETC Area 5: PHYSICAL AND BIOLOGICAL SCIENCES: A: Physical Science  
    IGETC Area 5: PHYSICAL AND BIOLOGICAL SCIENCES: B: Biological Science
  
3. **COURSE DESCRIPTIONS:**  
**Catalog Description:**  
    The origin and evolution of the planet and life on earth through the past 4.6 billion years. Includes the study of fossils, rocks, geologic time, dating methods, evolution by natural selection, modern and ancient ecosystems, plate tectonics, speciation and mass extinction.
  
4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**  
    Upon successful completion of this course, a student will meet the following outcomes:
  - A. Demonstrate an understanding of the nature of scientific knowledge and distinguish between true science and pseudoscience.
  - B. Demonstrate an understanding of the following concepts and principles: a. geologic time and dating methods b. evolution, extinction and speciation c. minerals and rocks d. plate tectonics e. fossilization f. ecosystems g. paleogeography and paleoclimate
  - C. Effectively describe multiple lines of evidence that support the theory of evolution by natural selection, plate tectonics theory or the immensity of geologic time.
  - D. Solve quantitative problems associated with geologic, biologic or paleontologic concepts
  - E. Interpret graphical representations associated with geologic, biologic or paleontologic concepts
  - F. Explain the tectonic processes that shape the Earth and their influence on the environment, ecosystems and evolution
  - G. Draw appropriate conclusions from the application of scientific principles in interpretation of fossils, minerals, rocks and geologic cross sections
  
5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**  
    Upon successful completion of this course, a student will be able to:
  - A. Demonstrate an understanding of the nature of scientific knowledge and distinguish between true science and pseudoscience
  - B. Demonstrate an understanding of the following concepts and principles: a. geologic time and dating methods b. evolution, extinction and speciation c. minerals and rocks d. plate tectonics e. fossilization f. ecosystems g. paleogeography and paleoclimate
  - C. Effectively describe multiple lines of evidence that support the theory of evolution by natural selection, plate tectonics theory or the immensity of geologic time
  - D. Solve quantitative problems associated with geologic, biologic or paleontologic concepts
  - E. Interpret graphical representations associated with geologic, biologic or paleontologic concepts
  - F. Explain the tectonic processes that shape the Earth and their influence on the environment, ecosystems and evolution
  - G. Draw appropriate conclusions from the application of scientific principles in the interpretation of fossils, minerals, rocks and geologic cross sections

## 6. COURSE CONTENT:

### Lecture Content:

- A. Introduction
  - Defining Science
  - Eclectic Nature Of Paleontology
  - History Of Paleontology
- B. Geologic Time And Dating
  - Geologic Time Scale
  - Relative And Absolute Dating
- C. Minerals, Igneous & Metamorphic Rocks
  - Formation And Interpretation
- D. Sedimentary Rocks
  - Formation
  - Interpretation Of Sedimentary Structures And Depositional Environments
  - Stratigraphy, Facies & Correlation
- E. Fossils
  - Preservation
  - Fossils As Clues To Environments
  - Dating With Fossils
- F. Evolution
  - Lamarck, Darwin And Wallace
  - Natural Selection And Genetics
  - Evidence Of Evolution
  - Speciation & Extinction
  - Mechanisms, Patterns And Rates Of Evolution
- G. Organization Of Life
  - Taxonomy
  - Phylogeny
  - Cladistics And Cladogram Construction
- H. Ecosystems & Paleoclimate
  - Terminology
  - Ecosystem Interactions
  - Paleoclimate Indicators
- I. Plate Tectonics
  - Earth Structure
  - Plate Tectonics Basics
  - Effects On Paleoclimate
- J. Origin Of The Earth And Life On Earth
  - Nebular Theory
  - Early Atmosphere
  - Amino Acids
- K. Precambrian Geology And Life
  - Archean Terranes
  - Proterozoic Supercontinents
  - Prokaryote To Eukaryotes To Multicellular Life
  - Ediacaran Fauna
- L. Paleozoic Geology & Life
  - Orogenies And Paleogeography
  - Cambrian Explosion
  - Cheng Jiang & Burgess Shale Fossils
  - Marine Invertebrates
  - Fish, Amphibians And Reptiles
  - Land Plants: Psilophytes, Gymnosperms
  - Permian Extinction
- M. Mesozoic Geology & Life
  - Orogenies And Paleogeography
  - Dinosaurs
  - Marine Reptiles
  - Flying Reptiles
  - Early Mammals
  - Birds
  - Flowering Plants
  - K/T Extinction
- N. Cenozoic Geology & Life
  - Orogenies And Paleogeography
  - Mammal Radiation
  - Primates & Hominids
  - Ice Age Mammals
  - Pleistocene Extinction

## 7. REPRESENTATIVE METHODS OF INSTRUCTION:

Typical methods of instruction may include:

- A. Discussion
- B. Other (Specify): The following methodologies are appropriate. Individual faculty will use whatever mix of these they find most effective in the presentation of each topic. a. Lecture presentation supplemented by demonstrations, visuals and/or rocks or fossils b. Instructor-led class discussions c. Hands-on work with

fossils and/or rocks to illustrate features and/or differences d. In-class exercises to practice identification, interpretation or application of new skills/knowledge using fossils, rocks, models or simulated situations. Hours by arrangement will usually include obtaining additional information about paleontological topics from books or the internet in the Integrated Science Center or in my office or lab room. Students will demonstrate their proficiency of the new material at the end of their hour by arrangement by answering questions posed by the instructor.

#### 8. REPRESENTATIVE ASSIGNMENTS

Representative assignments in this course may include, but are not limited to the following:

#### 9. REPRESENTATIVE METHODS OF EVALUATION

Representative methods of evaluation may include:

- A. Class Work
- B. Exams/Tests
- C. Home Work
- D. Projects
- E. Written examination
- F. Instructors have considerable discretion in determining course grades, but the department expects in-class tests to account for approximately 80% of the final grade. Projects, homework and in-class assignments typically combine to account for the remaining 20% of the grade.

#### 10. REPRESENTATIVE TEXT(S):

Possible textbooks include:

- A. Harold Levin. *The Earth Through Time*, 9th ed. John Wiley & Sons, 2010
- B. R. Wicander & J. Monroe. *Historical Geology; Evolution of the Earth and Life Through Time*, 6th ed. Brooks/Cole/Cengage Learning, 2010

**Origination Date:** August 2010

**Curriculum Committee Approval Date:** April 2013

**Effective Term:** Fall 2013

**Course Originator:** Linda Hand