College of San Mateo
Official Course Outline

1. **COURSE ID:** PALN 111 **TITLE:** Paleontology Laboratory/Field Studies
   Semester Units/Hours: 1.0 units; a minimum of 48.0 lab hours/semester
   Method of Grading: Letter Grade Only
   Prerequisite: completion of or concurrent enrollment in PALN 110

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: B3 - Laboratory Activity
   IGETC:
   IGETC Area 5: PHYSICAL AND BIOLOGICAL SCIENCES: C: Science Laboratory

3. **COURSE DESCRIPTIONS:**
   Catalog Description:
   Optional introductory paleontology laboratory course designed to be taken concurrently with or following PALN 110. Laboratory exercises in dating methods, fossil preservation, rock, fossil and ecosystem identification and interpretation, stratigraphic correlation, natural selection and extinction processes, fossil collection and preparation. Field trips to depositional/ecological environments and fossil sites required.

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 paleontologic concepts by being able to apply these concepts to identify and interpret facets of evolution, earth materials, plate tectonics, dating, fossils or ecosystems.
   B. Solve quantitative problems associated with plate tectonic rates and/or dinosaur speed.
   C. Interpret graphical representations associated with dimensionless speed, paleoclimate proxies and radiometric dating.
   D. Interpret geologic maps, cross sections and stratigraphic columns.
   E. Draw appropriate conclusions from the application of scientific principles and/or empirical results and communicate the results effectively in writing and diagrams.

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**
   Upon successful completion of this course, a student will be able to:
   A. Demonstrate an understanding of paleontologic concepts by being able to apply these concepts to identify and interpret facets of evolution, earth materials, plate tectonics, dating, fossils or ecosystems.
   B. Solve quantitative problems associated with plate tectonic rates and/or dinosaur speed
   C. Interpret graphical representations associated with dimensionless speed, paleoclimate proxies and radiometric dating.
   D. Interpret geologic maps, cross sections and stratigraphic columns.
   E. Draw appropriate conclusions from the application of scientific principles and/or empirical results and communicate the results effectively in writing and diagrams.

6. **COURSE CONTENT:**
   Lab Content:

   1. nature of science & cumulative nature of natural selection
   2. dna, island biogeography and phylogenetic trees
   3. rock types and fossil preservation
   4. geologic maps and cross sections
   5. deep time, relative dating & radiometric dating
   6. important fossil taxa & living fossils
   7. sedimentary depositional environments
   8. interpreting geologic history & paleoecology field trip

9. paleoclimate proxies
10. stratigraphic columns, facies, fossils and paleogeographic reconstructions
11. fossil collecting field trip
12. fossil preparation practice
13. tracks, size and dimensionless speed
14. resurrecting an extinct organism

7. **REPRESENTATIVE METHODS OF INSTRUCTION:**
Typical methods of instruction may include:
   A. Lecture
   B. Lab
   C. Activity
   D. Experiments
   E. Field Trips
   F. Observation and Demonstration
   G. 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. Review of paleontologic, geologic or biologic principles lecture with visual aids (transparencies, samples, maps), laboratory exercises, hands-on experience with mineral, rock and fossil samples, required reading of lab manual, required application of key terms, concepts and techniques, and required field trips.

8. **REPRESENTATIVE ASSIGNMENTS**
Representative assignments in this course may include, but are not limited to the following:
Writing Assignments:
Writing Assignment Examples:

Describe the steps involved in the creation of a natural fossil cast. Start with the death of the organism.

Write a paragraph describing the geologic history of the area depicted in the geologic cross section provided.

Reading Assignments:
Required reading of background information and instructions associated with each lab exercise.

9. **REPRESENTATIVE METHODS OF EVALUATION**
Representative methods of evaluation may include:
   A. Class Participation
   B. Exams/Tests
   C. Field Trips
   D. Group Projects
   E. Lab Activities
   F. Quizzes
   G. Instructors have considerable discretion in determining course grades, but the department expects in-class quizzes/tests and field trip exercises to account for at least 50% of the final grade. Methods of evaluation include written and objective questions and application of appropriate methods and concepts applied to fossils, rocks, phylogenetic trees, sedimentary structures, genetic data, isotope data, paleoclimate proxies, geologic maps, geologic structures, cross-sections and stratigraphic columns.

10. **REPRESENTATIVE TEXT(S):**
Possible manuals include:
   A. Poort, J. and Carlson, R.. Historical Geology: Interpretations and Applications, Pearson, 01-10-2010
   B. Gore, P.. Historical Geology Lab Manual, John Wiley & Sons Inc., 09-10-2013
Other:
   A. modified lessons from the ENSI/SENSI website
   http://www.indiana.edu/~ensiweb/main.fr.html

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Course Originator: Linda Hand