College of San Mateo
Official Course Outline

1. **COURSE ID:** GEOL 101 **TITLE:** Geology Laboratory **C-ID:** GEOL 100L
   Units: 1.0 units **Hours/Semester:** 48.0-54.0 Lab hours
   Method of Grading: Letter Grade Only
   Prerequisite: completion or concurrent enrollment in GEOL 100

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 geology laboratory course designed to be taken concurrently with or following GEOL 100. Identification of tectonic plates, minerals, rocks; interpretation of cross sections, maps and seismograms; geologic processes and features.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**
   Upon successful completion of this course, a student will meet the following outcomes:
   1. Demonstrate an understanding of the scientific method in laboratory exercises
   2. Demonstrate an understanding of geologic concepts and principles by identifying/interpreting geologic features
   3. Solve quantitative problems associated with geologic processes and maps
   4. Demonstrate the ability to read and interpret topographic and geologic maps
   5. Draw appropriate conclusions from the application of principles of plate tectonics, geologic structures or dating and communicate their conclusions in writing and diagrams
   6. Identify and evaluate earth materials

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**
   Upon successful completion of this course, a student will be able to:
   1. Demonstrate an understanding of the scientific method in laboratory exercises
   2. Demonstrate an understanding of geologic concepts and principles by identifying/interpreting geologic features
   3. Solve quantitative problems associated with geologic processes and maps
   4. Demonstrate the ability to read and interpret topographic and geologic maps
   5. Draw appropriate conclusions from the application of principles of plate tectonics, geologic structures or dating and communicate their conclusions in writing and diagrams
   6. Identify and evaluate earth materials

6. **COURSE CONTENT:**
   Lab Content:
   A minimum of 10 of the following activity topics:
   Plate Tectonics
   - Tectonic Plates
   - Mapping Plate Boundaries
   - Determining Plate Rates

   Earthquakes & Seismology
   - Types Of Seismographs
   - Seismic Waves & Their Propagation
   - Triangulation

Determination Of Earthquake Magnitude
First Motion Application

Geologic Structures
Faults
Folds

Geologic Maps & Cross Sections
Interpretation Of Geologic Maps & Cross-Sections

Minerals
Criteria
Mineral Groups
Physical Properties
Identification And Evaluation Of Minerals

Rocks
Igneous Processes & Rocks
Igneous Compositions
Cooling Rates & Crystal Size
Igneous Textures
Identification And Evaluation Of Igneous Rocks
Sedimentary Rocks
Sediment
Interpreting Sedimentary Features
Identification And Evaluation Of Sedimentary Rocks
Metamorphic Processes And Rocks
Agents/Causes/Types Of Metamorphism
Changes To The Parent Rock
Identification And Evaluation Of Metamorphic Rocks

Topographic Maps
Reading Maps
Location/Coordinate Systems
Interpretation Of Topographic Contours
Construction Of Topographic Profiles

Groundwater Processes
Groundwater Movement
Hazards And Risks

Geologic Time
Geologic Time Scale

Dating Methods
Relative Dating
Absolute Dating
Application Of Dating Principles

Field Trip

7. **REPRESENTATIVE METHODS OF INSTRUCTION:**
Typical methods of instruction may include:
A. Lecture
B. Lab
C. Activity
D. Experiments
E. Field Trips
F. 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 geologic principles pre-lab

lecture with visual aids (photos, diagrams, samples, maps), laboratory exercises, hands-on experience with minerals and rocks, required reading of lab materials, required application of key terms, concepts and techniques and field trips.

8. **REPRESENTATIVE ASSIGNMENTS**

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

Writing Assignments:

Written answers to laboratory exercise questions and test questions.

Reading Assignments:

Required reading of background materials prior to labs.

Required reading of lab instructions and materials during labs.

9. **REPRESENTATIVE METHODS OF EVALUATION**

Representative methods of evaluation may include:

A. Class Work
B. Exams/Tests
C. Field Trips
D. Homework
E. Lab Activities
F. Quizzes
G. Written examination
H. Instructors have considerable discretion in determining course grades, but the department expects in-class tests to account for at least 75% of the final grade. Laboratory assignments and homework typically combine to account for the remaining 25% of the grade. Methods of evaluation include written tests with both objective questions (true/false, multiple choice, matching), and application of geologic methods and concepts applied to seismograms, graphs, minerals, rocks, maps and cross-sections.

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

Possible textbooks include:

A. AGI/NAGT. *Laboratory Manual in Physical Geology*, 11th ed. Pearson, 2018

Origination Date: August 2020
Curriculum Committee Approval Date: September 2020
Effective Term: Fall 2021
Course Originator: Linda Hand