CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

ACADEMIC SENATE

GENERAL EDUCATION COMMITTEE

REPORT TO

THE ACADEMIC SENATE

GE-077-156

GSC 1510L – Earth, Time and Life Laboratory (GE B3)

General Education Committee	**Date: 2/4/2016**
Executive Committee **Received and Forwarded**	**Date: 5/17/16**
Academic Senate	**Date: 5/25/16** **First Reading**

BACKGROUND:
The Geological Sciences Department introduced a new semester course to satisfty the GE Area B3.

RESOURCES CONSULTED:
Faculty
Department Chairs
Associate Deans
Deans
Office of Academic Programs

DISCUSSION:

The GE Committee reviewed the ECO for this course and found it to satisfy the GE SLO's and other requirements of GE Area B3.

RECOMMENDATION:

The GE Committee recommends approval of GE-077-156 (GSC 1510L-Earth, Time and Life Laboratory for GE Area B3)

GSC - 1510L - Earth, Time, and Life Laboratory

C. Course - New General Education* Updated

General Catalog Information

- ****READ BEFORE YOU BEGIN****
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1. **Import curriculum data from the Catalog by clicking on the following icon . It is a BEST PRACTICE to always import data on existing courses. This will limit the opportunity for data errors.**
2. **Turn the help text on by clicking on the following icon .**
3. **All fields with an asterisk (*) are required fields. If left blank, the request will not be launched and cannot be acted upon.**
4. **Run and attach an impact report by clicking to show all courses and programs impacted by this proposal.**
5. **Attach additional documentation by clicking .**

- **Department***
  Geological Sciences
- **Semester Subject Area***
  GSC
  Semester Catalog Number*
  1510L
- **Quarter Subject Area**

  GSC

  Quarter Catalog Number

  151L
- **Course Title***
  Earth, Time, and Life Laboratory
- **Units***
  (1)
- **C/S Classification***
  C-16 (Laboratory)
- **To view C/S Classification Long Description click: http://www.cpp.edu/~academic-programs/scheduling/Documents/Curriculum%20Guide/Appendix_C_CS_Classification.pdf**
- **Component***
  Laboratory
- **Instruction Mode***
  Face-to-Face
- **Grading Basis***
  Graded Only
- **Repeat Basis***
  May be taken only once
- **If it may be taken multiple times, limit on number of enrollments**

  1
- **Cross Listed Course Subject Area and Catalog Nbr (if offered with another department)**

- **Dual Listed Course Subject Area and Catalog number (If offered as lower/upper division or ugrd/grad)**
- **Choose appropriate type(s) of course(s)***
  - [x] **Major Course**
  - [ ] **Service Course**
  - [x] **GE Course**
  - [ ] **None of the above**
- **General Education Area / Subarea***
  B3
- **To view the General Education SubArea definitions, click http://www.cpp.edu/~academic-programs/scheduling/Documents/Ch.3-GeneralEducationProposals.pdf.**
- **I. Catalog Description**
- **Catalog Description**

Classification of fossil invertebrates, studies of paleogeographic maps and geologic maps and problems in structural geology and crosscutting age relationships

- **II. Required Coursework and Background**
- **Prerequisite(s)**

None

- **Corequisite(s)**
- **Pre or Corequisite(s)**
- **Concurrent**
- **III. Expected Outcomes**
- **List the knowledge, skills, or abilities which students should possess upon completing the course.***

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

1. Describe and classify rock and fossil specimens that preserve a record of Earth history and environment change.

2. Outline main subdivisions of the geologic time scale.

3. Utilize cross cutting features, geologic maps and cross sections, and field relationships to interpret the historical sequence of events preserved in the rock record.

4. Apply elements of the scientific method to interpret ancient environments and the evolution of Earth's processes over geologic time.

5. Resolve practical problems in earth history with quantitative analysis.

- **If this is a course for the major, describe how these outcomes relate to the mission, goals and objectives of the major program.**

Outcomes of this course will build student capacity in each of the following areas as defined by program objectives and student learning outcomes for the Geology Bachelor of Science degree program.

PSLO-1. Recognize and implement various facets of the scientific method.

PSLO -2. Effectively communicate results of scientific investigations in written and oral format.

PSLO -3. Recognize common Earth materials, structures, and landforms, describe their properties, and determine their age relationships.

PSLO -4. Acquire geologic data in the laboratory or field using standard observational procedures and scientific equipment.

PSLO -5. Develop skills needed to function effectively and efficiently in the field.

PSLO -6. Use maps, cross sections, and other imagery to analyze and interpret spatial and temporal relationships displayed by Earth features or geologic data sets.

- **Explain how the course meets the description of the GE SubArea(s). Please select appropriate outcomes according to the GE Area/SLO mapping.**

This course reinforces principles learned in GE Area B1 physical science lecture courses such as Earth Time, and Life or Principles of Geology. Laboratory activities include observational and interpretive components of the scientific method and also include writing as an integral part of the process of learning and discovery. Given its emphasis on Earth history and changing environments over geologic time, this course provides an appropriate complement to any B1 course, and furthermore offers scientific context for general discussion of values and ethics related to global environmental change.

- **Describe how these outcomes relate to the associated GE Learning Outcomes listed below.***

These are the Expected SLOs for the selected GE subarea(s):1a) Write effectively for various audiences.

Students will use written words to describe observations pertaining to the historical rock record. Laboratory reports require a short written summary statement describing the work submitted. Quizzes and examinations contain short answer and/or essay questions that require students to describe their knowledge of specific course content in written words. (See also Course SLO 1, 2, 4 and 5 above)

1b) Speak effectively to various audiences

Some laboratory reports require oral presentation of observations or results to the class by individual students or student teams. Each laboratory activity involves group work efforts and verbal interaction between students, peers, and instructor. The field trip provides students additional opportunities to orally describe features preserved in the rock record. (See also Course SLO 1 and 4 above)

1d) Construct arguments based on sound evidence and reasoning to support an opinion or conclusion.

This course intentionally asks students to interpret events or processes that occurred long in the past. Conclusions draw upon evidence preserved in the rock record that may be incompletely preserved. Therefore, the observations made by students commonly yield more than one interpretation (competing hypotheses) and the conflict is resolved through reasoning (See also Course SLO 1, 2, 3, 4 above)

1e) Apply and communicate quantitative arguments using equations and graphical representations of data.

Several laboratory activities require extraction of numerical data (dimensions, angles, quantities) from maps and cross sections, interpretation of graphs, and application of equations to support results. Examples may include determination of map scale, measurement of stratigraphic thickness, calculation of sedimentation rates, and deduction of radiometric age from graphs of radioactive decay. In general, geoscience is pervaded with graphical representations of data that aid interpretations. (See also Course SLO 5 above)

2a) Apply scientific methods and models to draw quantitative and qualitative conclusions about the physical and natural world.

This course addresses observation, descriptive, and interpretive components of the scientific method. Students use first-order observations to develop alternative working hypotheses for explaining processes and events that occurred in the ancient past. These techniques are especially emphasized on the field trip where students can visualize the natural world context. (See also Course SLO 1, 3, 4, and 5 above)

- **General Education Outcomes***

Ia. Write effectively for various audiences
Ib. Speak effectively to various audiences.
Id. Construct arguments based on sound evidence and reasoning to support an opinion or conclusion.
Ie. Apply and communicate quantitative arguments using equations and graphical representations of data.
IIa. Apply scientific methods and models to draw quantitative and qualitative conclusions about the physical and natural world.

- **To view the mapping, click https://www.cpp.edu/~academic-programs/Documents/GE%20SLO%20Mapping.pdf**
- **IV. Instructional Materials**
- **Provide bibliography that includes texts that may be used as the primary source for instruction, and other appropriate reference materials to be used in instruction. The reference list should be current, arranged alphabetically by author and the materials should be listed in accepted bibliographic form.**
- **Instructional Materials***

Primary Texts may vary with instructor and over time. Examples of possible texts include:1. Gastaldo, R., Savdra, C., Lewis, R., 2007, *Deciphering Earth History: Exercises in Historical Geology* (4th Edition); Contemporary Publishing Co.

2. Gore, Pamela J., 2014, *Historical Geology Lab Manual*, Wiley and Sons, 324 p.

Lectures, lecture notes, homework assignments, and current papers on the diverse topics will also be made available on BlackBoard* by the instructor.

- **Faculty are encouraged to make all materials accessible. Indicate with an asterisk those items that have had accessibility (ATI/Section 508) reviewed. For more information,http://www.cpp.edu/~accessibility**
- **V. Minimum Student Material**
- **List any materials, supplies, equipment, etc., which students must provide, such as notebooks, computers, internet access, special clothing or uniforms, safety equipment, lockers, sports equipment, etc. Note that materials that require the assessment of a fee may not be included unless the fee has been approved according to University procedures.**
- **Minimum Student Material***

notebook	Computer
graph paper	Internet service
e-mail	printer
cell phone	Standard writing materials
calculator	

VI. Minimum College Facilities

List the university facilities/equipment that will be required in order to offer this class, such as gymnastic equipment, special classroom, technological equipment, laboratories, etc.

Minimum College Facilities*

External Support

Information Technology (IT) Services	Classroom Management System (e.g. BB)
copier	Field Vehicle
scanner	

Physical Space & Major Equipment

sufficient plug-ins to support numerous electrical devices	wet lab (benches/sinks/gas/air) with seating for 25 students
smart classroom (computer/projector)	microscope(s)*
overhead screen	white board/dry erase markers
adjustable lighting	

VII. Course Outline

Describe specifically what will be included in the course content. This should not be a repetition of the course description but an expansion that provides information on specific material to be included in the class, e.g. lecture topics, skills to be taught, etc. This should not be a week-by-week guide unless all instructors are expected to follow that schedule.

Course Outline*

The following list is a representative sample of the topics that may be discussed during the class meetings:

- What is paleontology? What is good lab practice?
- Pre-test
- Description and Classification of Sedimentary Rocks
- Fossil Preservation and Taphonomy
- Early Paleozoic Life: The Cambrian Fauna
- Later Paleozoic Life
- Post-Paleozoic Life: The Mesozoic and Cenozoic Eras
- Relative Time and Sequence of Events
- Topical Lecture/ Field Trip Planning and Logistics
- Field trip
- Geologic Maps and Interpretation of Earth History

- Lab Practical

VIII. Instructional Methods

Describe the type(s) of method(s) that are required or recommended for the instruction of this course (lectures, demonstrations, etc.). Include any method that is essential to the course, such as the use of particular tools or software.

Instructional Methods*

lecture	field studies
problem-solving	case studies
discussion	individual instruction
small group activities	peer instruction
observation	creating and presenting a talk/speech
inquiry-based learning	project-based learning
assigned readings (textbook, journals, etc.)	demonstrations
outlining (readings, papers, activities, etc.)	invited speakers
review, evaluation, critique	project (by individual, group, and/or class)
study groups	

IX. Evaluation of Outcomes

Describe the methods to be used to evaluate students' learning, i.e. written exams, term papers, projects, participation, quizzes, attendance, etc.*

Students' learning of course content is evaluated **via laboratory reports, short quizzes, field trip report, and practical examination.** Suggested weighting in grade calculations is 65% laboratory and field trip reports, 10% quizzes, and 25% final practical exam. These evaluation methods will be graded using standard numerical methods and/or rubrics.

Laboratory Reports involve written and oral reports of rock specimens map or historical geologic relationships observed in the laboratory or field. Report content that might include description of rocks, minerals, or outdoor features, presentation of techniques for geotechnical illustration, visualization of geologic processes preserved in the rock record, and assessment of movies or guest lectures. Written reports shall include a concise summary statement. Oral reports may be presented individually or by teams of 2-3 students. Learning gain will occur through verbal interactions between students, peers and instructor.

Field Trip Report is a formal write-up describing the weekend field trip taken during week 8 or 9. This will include a chronological log of field trip stops and related observations, discussion of the historical geologic significance of each site, and a summary statement.

Short Quizzes, to be given periodically during laboratory meetings, will address recently covered content areas and assess short-term recall of important Earth history concepts. Instructor evaluations of quizzes provide study material to the student that is pertinent the practical examination. At least one quiz question will be written in nature and repeated on the final to assess student improvement and knowledge gained.

Practical Examination (final) is a structured, hands-on activity with a time limit, to be completed individually. Students will demonstrate the knowledge gained in laboratory by identifying fossils and rock specimens, interpreting geologic maps and cross-cutting relationships. Types of questions may include multiple choice, match-up, short answer, label drawings or diagrams, short essays, calculations, and illustrate geologic processes or features with drawings.

- **Describe the meaningful writing assignments to be included.***

Students will have multiple opportunities to demonstrate effective writing, with feedback provided through instructor comments. Laboratory reports require a short written summary statement describing the work submitted. The field trip report is a formal written document describing field activities, observations and relevance to Earth history Quizzes and examinations contain short answer and/or essay questions that require students to describe their knowledge of specific course content in written words. Selected quiz questions will be written in nature, evaluated by the instructor, and repeated on the practical examination to assess student improvement and knowledge gained. This process also enables students to use the feedback to improve their technical writing.

- **Discuss how these methods may be used to address the course and program outcomes, as appropriate. Include or attach a matrix to align the evaluation methods to the outcomes.***

Below is a Matrix indicating how assessment methods align to course learning outcomes.

Student Learning Outcome (see detailed list in Part III above)	Methods of Assessment			
	Laboratory Reports	Short Quizzes	Field Trip Report	Practical Examination
#1: Describe and classify rocks and fossils	X		X	X
#2: Outline the geologic time scale		X		X
#3: Utilize cross-cutting features, geologic maps, and field relationships	X		X	
#4: Apply the scientific method	X		X	X
#5: Resolve problems with quantitative analysis	X	X		X

- **If this is a general education course, discuss how these methods may be used to address the associated GE Learning Outcomes listed below. Include or attach a matrix to align the evaluation methods to the outcomes.***

Below is a matrix indicating how assessment methods evaluate the GE learning outcomes:

GE Learning Outcome (see Part III above)	Methods of Assessment			
	Laboratory Reports	Short Quizzes	Field Trip Report	Practical Examination
#1a: Write effectively	X	X	X	X
#1b: Speak effectively	X			
#1d: Construct arguments	X		X	X

#1e: Quantitative reasoning	X	X		X
#2a: Scientific method	X		X	X

- **X. This OPTIONAL Section is for describing Course/Department/College specific requirements.**
- **Department/ College Required ECO Information (Optional)**