Course Proposal: Modify Course

This proposal will change the following elements of the course.
**Course Description**
**Credit Hours**

1. Course prefix and number: **GOL 132**

2. Effective Term/Year: **FALL 2014**

3. CIP CODE/10 digit program code: **No Change**

4. Short Course Title: **The Earth Through Time**

Modified Short Course Title:

5. What is the primary reason you are modifying this course?
**Aligning curse with new university core requisites.**

6. Enter course description exactly as it now appears in the general/graduate bulletin.
**The Earth Through Time (GEOL 1404) - Four semester hours, three hours lecture, two hours laboratory per week. History and development of the continents and ocean basins and the evolutoin of life on Earth. Includes earthquakes and the Earth's interior, mountain building, drifting continents and sea-floor spreading, the ice ages, space science and oceanography. Required lab fee. Prerequisite: GOL 131.**

Enter modified course description exactly as it will appear in the general/graduate bulletin?
**The Earth Through Time (GEOL 1404) - History and development of the continents and ocean basins and the evolutoin of life on Earth. Includes earthquakes and the Earth's interior, mountain building, drifting continents and sea-floor spreading, the ice ages, space science and oceanography. Prerequisite: GOL 131. Co-requesite: GOL 132L.**

7. Current Prerequisites: **No Change**

Modified Course Prerequisites:

8. College: **College of Science and Mathematics**

9. Department Teaching Course: **Mathematics and Statistics**

10a. Instruction Type: **Lecture**

10b. Credit Hours:
Current - Maximum: **4** Minimum: **4** Maximum Hours counted toward degree: **4**
Modified- Maximum: **3** Minimum: **3** Maximum Hours counted toward degree: **3**

11a. Second Instruction Type: **ns No Change**

11b. Second Credit Hours:
Current - Maximum: Minimum: Maximum Hours counted toward degree:
Modified- Maximum: Minimum: Maximum Hours counted toward degree:

12. Maximum contact hours each week fall semester:
Lecture: **3** Lab: **0** Other: **0**

13. May this course be taken more than one time each semester: **No**

14. Grade Type: **Not Graded No Change**

15. Describe the place of the modified course within your current curriculum. Will it be elective or required? Part of a major or a minor? (Enter NA if no change is being made.)
**NA**

16. How does the modified course differ from similar courses being offered at Stephen F. Austin? (Enter NA if no change is being made.)
**NA**

17. Syllabus: Course Learning Goals
List course objectives; describe what students who complete the course will know or be able to do. (Enter NA if no change is being made.)

**NA**

18. Syllabus: Course Outline
List the topics that the modified course will cover and indicate the approximate proposed amount of time to be devoted to each, either by percent of course time or number of weeks. Please indicate which topics will be required in all sections of the course and which may vary.
(Enter NA if no change is being made.)
**NA**

19. Syllabus: Modified Textbook/Assigned Reading Materials for course.
**NA**

20. Any Other Information
**NA**

Dept. Chair _____ Date: 11/5/13

College Curriculum Chair _____ Date: _____

College Dean _____ Date: _____

Grad Dean/Univ Curr Chair _____ Date: _____

Course Proposal: Modify Course

This proposal will change the following elements of the course.
**Course Description**
**Credit Hours**

1. Course prefix and number: **GOL 132L**

2. Effective Term/Year: **FALL 2014**

3. CIP CODE/10 digit program code: **No Change**

4. Short Course Title: **The Earth Through Time Laborator**

   Modified Short Course Title:

5. What is the primary reason you are modifying this course?
   **Aligning curse with new university core requisites.**

6. Enter course description exactly as it now appears in the general/graduate bulletin.
   **n/a - no description currently appears in the bulletin.**

   Enter modified course description exactly as it will appear in the general/graduate bulletin?
   **The Earth Through Time Laboratory - One semester hour, two hours lab per week. Lecture and laboratory grades are computed into one grade and the same grade is recorded for both lecture and lab. Co-requesite: GOL 132. Lab fee required.**

7. Current Prerequisites: **No Change**

   Modified Course Prerequisites:

8. College: **College of Science and Mathematics**

9. Department Teaching Course: **Geology**

10a. Instruction Type: **Lab**

10b. Credit Hours:
Current - Maximum: **0** Minimum: **0** Maximum Hours counted toward degree: **0**
Modified- Maximum: **1** Minimum: **1** Maximum Hours counted toward degree: **1**

11a. Second Instruction Type: **ns No Change**

11b. Second Credit Hours:
Current - Maximum: Minimum: Maximum Hours counted toward degree:
Modified- Maximum: Minimum: Maximum Hours counted toward degree:

12. Maximum contact hours each week fall semester: **No Change**
    Lecture: **0** Lab: **2** Other: **0**

13. May this course be taken more than one time each semester: **No**

14. Grade Type: **Regular: A-F No Change**

15. Describe the place of the modified course within your current curriculum. Will it be elective or required? Part of a major or a minor? (Enter NA if no change is being made.)
    **N/A**

16. How does the modified course differ from similar courses being offered at Stephen F. Austin? (Enter NA if no change is being made.)
    **N/A**

17. Syllabus: Course Learning Goals
    List course objectives; describe what students who complete the course will know or be able to do. (Enter NA if no change is being made.)
    **N/A**

18. Syllabus: Course Outline
    List the topics that the modified course will cover and indicate the approximate proposed amount of time to be devoted to each, either by percent of course time or number of weeks. Please indicate which topics will be required in all sections of the course and which may vary. (Enter NA if no change is being made.)

**N/A**

19. Syllabus: Modified Textbook/Assigned Reading Materials for course.
**N/A**

20. Any Other Information
**N/A**

Dept. Chair _____ Date: 11/5/13

College Curriculum Chair _____ Date: _____

College Dean _____ Date: _____

Grad Dean/Univ Curr Chair _____ Date: _____

**CoSM Class Syllabus / Policy**

**2014 / Fall**
**GOL 132 & GOL 132L**
**The Earth Through Time**

**Name:** Professor
**Department:** Geology
**Email:** abcdefg@sfasu.edu
**Phone:** 936-468-####
**Office:** E.L. Miller Science 3##
**Office Hours:** TBA or by appointment

**Class meeting time and place:** Varies: E.L. Miller Science 3##
**Lab meeting time and place:** Varies: E.L. Miller Science 3##

**Course Description**:

The Earth Through Time (GOL 132) – Four semester hours, three hours lecture, two hours laboratory per week. The history and development of the continents and ocean basins, and the evolution of life on Earth; includes earthquakes and the Earth's interior, mountain building, drifting continents and sea-floor spreading, the ice ages, space science, and oceanography.

**Program Learning Outcomes**:

There are no specific program learning outcomes for this major addressed in this course. It is a general education core curriculum course and / or a service course.

**General Education Core Curriculum Objectives/Outcomes**:

The student is expected to develop the following core objectives established by the THECB.

CO 1. **Critical Thinking Skills** – creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information. (SLO 1-4)

CO 2. **Communication Skills** – effective development, interpretation and expression of ideas through written and visual communication. (SLO 4-5)

CO 3. **Empirical and Quantitative Skills** – manipulation and analysis of numerical data or observable facts resulting in informed conclusions. (SLO 1-2,4)

CO 4. **Teamwork** – the ability to consider different points of view and to work effectively with others to support a shared purpose or goal. (SLO 3-5)

**Student Learning Outcomes for Lecture and Lab:**

After successful completion of this course students will be able to:

SLO 1. Demonstrate an understanding of stratigraphy and structural geology as it relates to Earth processes and evolution through geologic time. (Critical Thinking, Empirical and Quantitative Skills)

SLO 2. Use quantitative reasoning to interpret geologic data (tables, figures, graphs) from primary research, data assimilation and models to assess the differences in competing scientific theories. (Critical Thinking, Empirical and Quantitative Skills)

SLO 3. Demonstrate knowledge on the interdependence of science and technology and the influences geologic reasoning associated with identifiable and testable hypotheses. (Critical Thinking, Teamwork)

SLO 4. Critically assess the interrelationships between geologic processes and communicate the resulting conclusions in visual and written formats. (Critical Thinking, Communication, Empirical and Quantitative Skills)

SLO 5. Demonstrate an understanding of the skills and attitudes necessary for effective teamwork in collaborative learning activities. (Communication Skills, Teamwork)

**Text and Materials:**

- ***The Changing Earth with Geology of Texas*** (5th Ed.), Monroe et al.
- General Geology II Laboratory Manual

**Course Requirements**:

GOL132 (The Earth Through Time) is an introduction to the fascinating and complex processes of planet Earth – an ever-changing dynamic environment. Historical Geology is the evolutional history of geologic processes, and in this course, students will be introduced to the development of continents, ocean basins, mountain chains, volcanoes, earthquakes and many other geologic events. The rock record has also preserved the remains of various life forms, from microscopic invertebrates to large carnivorous reptiles and mammals. This course will introduce some of the various life forms that have evolved over time, their relative success and some of the factors that brought about their demise.

This class is a 4-credit hour course and has a weekly requisite lab where students will gain hands-on experience with fossils, geologic materials and data, and learn to interpret geologic maps. Grades from the lecture and lab will be averaged, with the lab counting 1/3 of the grade. You will receive one grade for the entire course, assigned by your lecture instructor.

## Lecture Course Information

**Lecture Course Calendar (required in all sections):**

Topics to be covered in GOL 132 Lecture include:

- Origin of the Universe and Solar System: ~10% of semester
- Geologic Time – Relative and Absolute Dating: ~10% of semester
- Principles of Stratigraphy: ~10% of semester
- Plate Tectonics: ~10% of semester
- Earthquakes: ~5% of semester
- Evolution: ~5% of semester
- Precambrian Earth & Life History: ~10% of semester
- Paleozoic Earth & Life History: ~10% of semester
- Mesozoic Earth & Life History: ~10% of semester
- Cenozoic Earth & Life History: ~10% of semester
- Human Evolution & Climate Change: ~5% of semester
- Geology of Texas: ~5% of semester

**Grading Policy:**

- Lecture counts 2/3 (66.7%) of course grade. Grades from each lecture test will count equally toward your final lecture grade. Lab counts 1/3 (33.3%) of the final course grade.
- Total points: 66.7% (Lecture) + 33.3% (Lab) = 100%
- Grade Scale: 90 – 100 + A, 80 – 89 + B, 70 – 79 = C, 60 – 69 = D, < 60 = F

All lecture exams will include a multiple-choice section with additional sections that will vary between exams but may include any or all of the following sections: 1) multiple choice questions; 2) true / false questions; 3) fill in the blank questions; 4) short answer questions; 5) figure illustration; 6) short essay questions. All exams will take place in room 335 unless otherwise stated in class.

Cell phones, calculators, and other electronic devices are NOT permitted during exams. If you are using them in an exam, it will be assumed that you are cheating and you will receive a grade of "0" on that exam.

Lecture exam scheduling conflicts for officially sanctioned university reason will be accommodated at a different time or date. In the event of such conflicts, you must inform me at least one week prior to the exam to reschedule your exam.

Make-up exams are only given in documented cases of official university activities, illnesses or deaths in the family. If the final is missed for a legitimate excuse, an "Incomplete" will be given at the final and a make-up exam can be taken at the beginning of the next semester. Make-up exams will be different than the regular class exam and may be entirely essay format.

**Attendance Policy:**

- Daily attendance will be taken for university accounting purposes. Success in this course will reflect the level effort you put into the course.
- Be prepared for lectures by reading the material to be covered in lecture prior to attending class. Questions are encouraged and welcome – do not hesitate to ask questions in class.
- No electronic devices are needed during lectures for this class, including cell phones and calculators. Please turn them off and do not use them in class. Ringing phones and beeping electronics disturb others in the class and interrupt lectures. If you interrupt class with your personal electronic devices, you will be asked to leave for the day.
- If you are late to class, please seat yourself quietly. Try not to be late because it interrupts others in the class. If you need to use the restroom or become ill, please excuse yourself from the lecture quietly.
- If you need to study for another class, do it elsewhere. The classroom is not the place to sleep either. Basically, refrain from activities in lectures that will distract or disturb the other students in the room.

## Laboratory Course Information

**Laboratory Exercises and Group Project:** In order to facilitate the inclusion of the General Education Core Curriculum Objectives uniformly across multiple sections of the course, these objectives will be addressed in the laboratory exercises. Weekly laboratory exercises will reinforce lecture material with practical exercises designed to enhance specific General Education Core Curriculum Objectives. Each week, students will be introduced to these core objectives in the form of classroom exercises and electronic assignments delivered through the SFA platform Desire2Learn (d2l). Students will be responsible for accessing and downloading material and assignments from d2l and uploading pertinent laboratory materials and quizzes to d2l.

Each week, students will complete a laboratory exercise which will be turned in to the laboratory instructor for grading at the end of the class period. During the laboratory exercises, students will work individually and in teams to complete the in-class assignments. In addition to the classroom exercise, students will be responsible for taking a weekly requisite electronic quiz administered through d2l. The quizzes should be taken individually, and must be completed by 12 midnight on the days they were assigned (your weekly lab day). These electronic quizzes will address topics covered in the laboratory class and will be used to address the Critical Thinking, Written Communication, and Empirical and Quantitative Skills General Education Core Curriculum Objectives.

**Group Project:** During week 10, students will participate in a group project to analyze geologic data and create a final project which will address the Teamwork and Communication Skills General Education

Core Curriculum Objectives. The project is a major grade component and will require time outside the classroom. Final projects will be uploaded electronically by each student. More information on this assignment will be given before the project is assigned.

Your laboratory grade will consist of the following:

| | |
|---|---|
| • Weekly Laboratory Exercises (10 exercises @ 10 points each) | 100 |
| • Weekly Electronic Quizzes (10 quizzes @ 10 points each) | 100 |
| • Group Project (50 points) | 50 |
| • Exams (Midterm and Final Exam, 100 points each) | 200 |
| Total Points | 450 |

**Your average in lab will be determined by the number of points you earn divided by 450.**

**Laboratory Exams:** Two major exams will be given in the classroom during the laboratory period. Grades for laboratory classroom activities, exams, and electronic assignments will be delivered through d2l. You **will not** receive a separate grade for your lab performance. Your laboratory average will be sent to your lecture instructor and your final grade for the course will be assigned by your lecture instructor using the formula listed on page 2, Grading Policy.

**All make-up exams are departmental and will be given at one time.** It is the responsibility of the student to find out the date and time of the exam. The Laboratory Coordinator can provide that information. All exams must be made up **NO LATER THAN 2 WEEKS AFTER REGULARLY SCHEDULED TIME**.

**Laboratory Etiquette: Each laboratory exercise must be completed during the laboratory period.** You must be present for the entire laboratory in order to turn in the exercise at the conclusion of the laboratory. Cell phones and other electronic devices are NOT permitted during the class or exams. If you are using them in an exam, it will be assumed that you are cheating and you will receive a grade of "0" on that exam. If you are using them in class, you will be asked to leave.

**Missed work:** Attendance is mandatory for understanding the material and participating in class. Opportunities for make-up exercises/quizzes will be approved by the **Laboratory Coordinator** for **EXCUSED** absences only. The following constitutes an excused absence:

- Illness: note from doctor for day of the lab.
- Death in Family: must be documented by obituary clipping from newspaper or funeral home.
- Jury Duty: must be documented by note from judge or other court official.
- School Function: name must appear in Faculty Bulletin or note must be sent from instructor, coach, etc.

If you cannot document an excused absence, late work may be accepted at the discretion of the Laboratory Coordinator. Your grade will be lowered by 5% for each day the assignment is late, and will not be accepted one week after the assignment is due.

**After a student has missed more than 3 labs, 10 points will be deducted from the final lab average for each additional absence.** You are expected to come to lab, to be on time, and to stay for the duration of the lab. Whenever it is possible, arrangements should be made BEFORE the lab time so that provisions can be made.

**Help with the material:** Internet lab tutorials for laboratory exercises can be found on the d2l page for your assigned laboratory section. Teaching Assistants will hold tutorial sessions every Friday at 1:00 to help students with the material

**Laboratory Course Calendar (required in all sections):**

| | | General Education Core Curriculum Objective | | | | | |
|---|---|---|---|---|---|---|---|
| Week | Laboratory Topic | Critical Thinking | Communication Written | Communication Visual | Communication Oral | Empirical & Quantitative Skills | Teamwork |
| | Reporting Scientific Information Handout; | X | X | X | X | X | |
| 1 | Introduction to the Scientific Method and Critical Thinking; | X | | | | | |
| | Introduction to Geologic Time; Fossil Preservation; | X | | | | | |
| | Plant Fossils; Instruction for Electronic Quizzes; | X | | | | | |
| | Critical Thinking Skills Quiz (d2l) | X | X | | | | |
| | Introduction to Teamwork; Introduction to Empirical | | | | | | X |
| 2 | and Quantitative Skills; Habitat and Mode of Life; | X | | | | X | |
| | Phyla Protozoa, Porifera, and Cnidaria; | X | | | X | | X |
| | Critical Thinking Quiz (d2l) | X | X | | | | |
| | Phyla Bryzoa and Brachiopoda | X | | | | | X |
| 3 | Evolutionary Trends; | X | X | | | | |
| | Critical Thinking Quiz (d2l) | X | X | | | | |
| | Phylum Mollusca | X | | | | | X |
| 4 | Sinuosity of Suture Patterns; Evolutionary Trends; | | X | | X | X | |
| | Empirical & Quantitative Skills Quiz (d2l) | | X | X | | X | |
| | Phyla Echinodermata and Arthropoda; | X | | | | | X |
| 5 | Biostatistical Analyses; | | X | X | | X | |
| | Empirical & Quantitative Skills Quiz (d2l) | | X | | | X | |
| | Phylum Hemichordata; Patterns of Evolution; | X | | | | | X |
| 6 | Evolution or Extinction Exercise; | X | X | X | X | X | X |
| | Critical Thinking Quiz (d2l) | X | X | | | | |
| 7 | Midterm Exam (classroom) | X | X | | | | |
| | Geologic Histories; | X | | | X | X | X |
| 8 | Unconformities; Geologic Principles; | X | X | | | | X |
| | Critical Thinking Quiz (d2l) | X | X | | | | |
| | Formations and Facies; | X | | | | | |
| 9 | Relative and Absolute Age Relationships; | X | X | | X | X | X |
| | Empirical & Quantitative Skills Quiz (d2l) | | X | | | X | |
| | Seafloor Spreading and Magnetism | X | X | | | X | X |
| 10 | Supercontinents; Teamwork Evaluation; | X | X | | | X | X |
| | Group Project (d2l) | X | X | X | X | X | X |
| | Structural Geology - Folds; | X | X | | | | X |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 11 | Interpretation of Geologic Maps; | X | X | X | X | | X |
| | Critical Thinking Quiz (d2l) | X | X | | | | |
| | Structural Geology - Faults; | X | X | | | | X |
| 12 | Interpretation of Geologic Maps; | X | X | X | X | X | X |
| | Empirical & Quantitative Skills Quiz (d2l) | X | X | | | X | |
| 13 | Final Exam (classroom) | X | X | | | X | |

**Academic Integrity** ***(A-9.1)***

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty

Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp

**Withheld Grades** ***Semester Grades Policy (A-54)***

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

**Students with Disabilities**

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

## Critical Thinking Assessment Questions – GOL 132

### Introduction to Geologic Time Laboratory

1. Refer to the Geologic Time Scale in your laboratory manual. What geologic principles are used to divide the time scale into eras and periods? How has this work been refined by scientific discoveries in the 20th century? (Week 1)

### Habitat and Mode of Life Laboratory

2. A fossil is defined as any evidence of past life that has been preserved in rock, sediment or ice. Depending on its age and depositional environment, some fossils are altered by chemical and/or physical change while other fossils exist in relatively young sediments and ice as unaltered remains. Regardless, most scientists agree that the fossil record is not fully representative of the once living community of organism and is said to be biased. What are some of the biases of the fossil record? Explain your answer in terms of an organism's habitat, mode of life, and body structure. (Week 2)

### Phyla Bryzoa and Brachiopoda Laboratory

3. Articulated brachiopods were benthonic organisms that live attached on shallow sea bottoms. Two specimens, *Genus Rafinesquina* (A) and *Genus Paraspirifer* (B) are represented in the pictures. What does the morphology of their valve features tell us about their evolutionary development and the water depth in which they lived? Explain your answer. (Week 3)

### Evolution or Extinction Laboratory

4. The Law of Faunal Succession states that there is a systematic progression of fossil forms from older rocks to younger rocks. These progressions, or changes, take place laterally as depositional environments change, and vertically as geologic time progresses. Once a species evolves and becomes extinct, it never reappears in the fossil record. How does the Law of Faunal Succession support Darwin's theory of Evolution? How would this law help a modern day geologist looking at rock samples from deep wells drilled in the Gulf of Mexico? (Week 6)

### Geologic Histories Laboratory

5. Using the geologic principles you learned in laboratory this week, put the following geologic events in chronological order. For each event, state what geologic principle you used to determine the order in which the events occurred. (Week 8)

**Structural Geology - Folds Laboratory**

6. Examine the map and answer the following questions:
   a. What type of fold structure is represented within box A?
   b. Is it an upright fold or a plunging fold? If it is a plunging fold, what direction is it plunging?
   c. What information did you use from the map to determine what type of fold structure was within box A?
   d. Explain what type of tectonic setting would produce this fold structure?
   e. Based on the timeline of major orogenic events, the ages of the rocks, and the geographic location of the area, what orogeny produced this folding event? (Week 12)

**NOTE: These questions are not part of the actual syllabus and are included in this document to facilitate the committee review of our application.**

## Empirical and Quantitative Skills Assessment Questions – GOL 132

### Phylum Mollusca Laboratory

1. Use the data set provided to create an Excel spreadsheet and calculate the sinuosity of the suture patterns for the four sub-classes of cephlapods. Using your calculations, create a graph plotting sinuosity (vertical axis) versus geologic time (horizontal axis). What evolutionary trends do you observe in the data? Does increasing complexity equate to evolutionary success? Which sub-class would be considered the most successful? (Week 4)

### Phyla Echinodermata and Arthropoda Laboratory

2. Today in your laboratory exercise, you performed various measurements on two genera of Class Echinoidea. Use the data set provided to calculate the relative volume of two genera of echinoderms. Using your calculations, plot the relative volume (vertical axis) versus geologic time (horizontal axis) of the two genera. What trends are you able to observe? (Week 5)

### Relative and Absolute Age Relationships Laboratory

3. Use the table provided to determine the half-life of relevant isotope pairs and answer the following questions:
   a. Determine the age of a shale sample with leaf fossils containing 21 ppma (parts per million by atomic proportions) of 14C and 651 ppma of 14N.
   b. A sandstone unit contains grains with 2.03 ppma 238U and 0.17 ppma 206 Pb. How old are the grains in the sandstone? How old is the rock? (Week 9)

### Structural Geology - Faults Laboratory

4. Use the data provided to answer the following questions:
   a. Determine the inclination of the fault plane using the three elevation points provided.
   b. Based on the outcrop patterns, determine which block is the up-thrown side of the fault?
   c. Based on the inclination of the fault plane and the sense of relative movement of the fault blocks, what type of fault is present? (Week 12)

**NOTE: These questions are not part of the actual syllabus and are included in this document to facilitate the committee review of our application.**

## Seafloor Spreading and Magnetism Group Project – GOL 132

Students will be assigned to work in a group of 2-3 members to foster Teamwork and Communication Skills. For the exercise, students will be supplied with a data set and asked to determine the rate of seafloor spreading in the Atlantic and Pacific Oceans. The students will be instructed to use technology, in the form of Excel, to create a spreadsheet to organize their data. Students will then use their data to hypothesize the future location of the North American continent and answer some basic questions allowing them to interpret their data.

### Goals of the Activity:

1. Foster communication and organizational skills among team members.
2. Facilitate the understanding of the relationship between the rate of seafloor spreading, continental movement, and plate boundary dynamics.
3. Strengthen empirical and quantitative skills by the use of technology to manipulate data.
4. Create graphic displays of their data by generating a graphic that shows the rate of spreading in the Atlantic and Pacific Oceans.
5. Strengthen analytical skills by encouraging students to interpret their data.
6. Strengthen written communication skills by asking students to communicate their findings in a formal laboratory report.
7. Strengthen oral and visual communication skills by asking students to work together to create visual graphics from their data in order to report technical information.

Students will be required to work together to process the data, create their spreadsheets and graphs, and discuss various ways to interpret the data. Students will be able to demonstrate their teamwork skills while performing data processing and graphing, and outlining their laboratory reports. Although students are encouraged to work together toward a final product, each student will be responsible for producing an individual formal laboratory report complete with the data sets, calculations, and plots. Individual laboratory reports should be uploaded to d2l. Each laboratory report should list their name as the author, with their team member's names as co-authors.

Students will also be asked to critique the teamwork experience using an online evaluation to determine peer participation and their thoughts on the group project.

**NOTE: This project description is not part of the actual syllabus and is included in this document to facilitate the committee review of our application.**