Student Learning Outcomes/Objectives, with Any Associations and Related Measures, Targets, Findings, and Action Plans

SLO 1: Critical Thinking Skills

Through lectures and lab exercises, students will gain an understanding of how to critically evaluate multiple working hypotheses regarding geologic questions, or evaluate theories that have been postulated with respect to the Earth. In lecture, students will learn about and evaluate laws, theories and hypotheses regarding the formation of the Earth and solar system, plate tectonics, the formation of rocks, geologic dating, evolution, natural hazards, and global climate change. In labs students will critically evaluate their ideas regarding the identification of minerals and rocks, as well as the evolution of landscapes they see on topographic maps.

Relevant Associations:

Standard Associations

- New Core Component Areas
  2. Life & Physical Science (L & PS)
- New Core Objectives
  1. Critical Thinking (CT)

General Education/Core Curriculum Associations

1. Critical Thinking: Students will apply critical thinking appropriately to identify, analyze and resolve complex issues.

Strategic Plan Associations

Lamar University

14.1 To offer undergraduate and selected graduate educational experiences of excellence, both curricular and co-curricular, which engage students with faculty and staff to meet their diverse needs. (Recruitment, retention, financial support, distance education, curriculum, academic excellence, student engagement, communication, and student life)

Related Measures

M 1: End of Semester Lecture Quiz 1

A quiz will be given in each lecture section taught at Lamar University that will contain at least 10 questions related to critical thinking. The instructors will create their own quiz. A sample quiz has been uploaded. The average of all these quizzes will be used to determine if the target was met.

Source of Evidence: Academic direct measure of learning - other

Connected Document

GEOL 1403 Outcome 1: Critical Thinking: Lecture Quiz

Target:
The average for all questions in this quiz for all sections is expected to be greater than or equal to 65% to meet the target.

M 2: Rock and Mineral Lab Quizzes

Three quizzes will be given in lab to test the students critical thinking skills regarding the analysis and identification of rocks and minerals. These quizzes will be averaged and the final average will be used to determine if the target is met. Samples of these quizzes have been uploaded.

Source of Evidence: Academic direct measure of learning - other

Connected Document

GEOL 1403 Outcome 1: Critical Thinking: Mineral and Rock Lab Quizzes

Target:
The average for all questions in all three quizzes for all sections is expected to be greater than or equal to 65% to meet the target.

SLO 2: Empirical and Quantitative Skills

In lecture and lab, students will learn empirical analysis skills by empirically observing geologic features and determining what processes created these features. In lecture these observed features are in the form of pictures and descriptions of the features while in lab they included physical samples of rocks and minerals as well as maps and other diagrams. In lab and lecture, students will also learn quantitative skills by using various mathematical formulas to solve problems regarding geologic features and processes.

Relevant Associations:

Standard Associations

- New Core Component Areas
  2. Life & Physical Science (L & PS)
- New Core Objectives
  3. Empirical & Quantitative Skills (EQS)

General Education/Core Curriculum Associations

2. Quantitative Thinking: Students will demonstrate mastery of quantitative reasoning and algorithms used to address applied problems

Strategic Plan Associations
Related Measures

**M 3: End of Semester Lecture Quiz 2**
A quiz will be given in each lecture section taught at Lamar University that will contain at least 10 questions related to empirical and quantitative skills. The instructors will create their own quiz. A sample quiz has been uploaded. The average of all these quizzes will be used to determine if the target was met.

Source of Evidence: Academic direct measure of learning - other

**Target:**
The average for all questions in this quiz for all sections is expected to be greater than or equal to 65% to meet the target.

**Connected Document**
GEOL 1403 Outcome 2: Empirical and Quantitative Skills: Lecture Quiz

**M 4: Lab Exercises using Empirical and Quantitative Methods**
Various lab exercises test the students’ empirical and quantitative skills. These exercises will be graded in each lab section on the Lamar University campus and averaged according to the weighting scheme shown in the uploaded document. The weighted average of all these exercises will be used to determine if the target was met.

Source of Evidence: Written assignment(s), usually scored by a rubric

**Target:**
After the weighted average for each student is calculated using the exercises mentioned for this measure, the average for all students in all the sections is expected to be greater than or equal to 65% to meet the target.

**Connected Document**
GEOL 1403 Outcome 2: Empirical and Quantitative Skills: Lab Exercises

**SLO 3: Communication Skills**
Students will learn to communicate with the instructor visually and in writing by completing lab exercises, which includes illustrations, and turning them into the instructor for grading and feedback.

**Relevant Associations:**

- **Standard Associations**
  - New Core Component Areas
    - 2. Life & Physical Science (L & PS)
  - New Core Objectives
    - 2. Communication (COM)

- **General Education/Core Curriculum Associations**
  - 3. Communication: Students will develop written and oral presentations that are clear, precise, organized, efficient and appropriately adapted to audience and purpose.

- **Strategic Plan Associations**
  - Lamar University
    - 14.1 To offer undergraduate and selected graduate educational experiences of excellence, both curricular and co-curricular, which engage students with faculty and staff to meet their diverse needs.

**Related Measures**

**M 5: Writing Proficiency in Lab Exercises**
Selected lab exercises turned in by the students to each section taught on the Lamar campus will be assessed by the corresponding lab instructor for that section using the uploaded Written Communication rubric. The score for each of the three categories will be averaged for each student and these three averages will be used to determine if the target was met. The scores are as follows: 1 = Below Expectations, 2 = Meets Expectations, 3 = Exceeds Expectations.

Source of Evidence: Written assignment(s), usually scored by a rubric

**Target:**
The average of all the students in each category is expected to be greater than or equal to 2.0 to meet the target. If the average in one or two of the categories falls below 2.0, then the target is partially met. If the average in all three categories falls below 2.0 then the target was not met.

**Connected Document**
GEOL 1403 Outcome 3: Written and Visual Communication Rubric

**SLO 4: Teamwork**
Students will learn to consider different points of view and work effectively with one another in small groups in lab to determine the best answers to lab exercises. This will occur for all the exercises in lab. Students will not only determine their own answers to the questions, but will also discuss their answers with those of other students opinions in their team. After team discussion, students will report their own answer to the question, but a single team answer will also be reported to the instructor in selected exercises.

**Relevant Associations:**

- **Standard Associations**
  - New Core Component Areas
    - 2. Life & Physical Science (L & PS)
  - New Core Objectives
4 Teamwork (TW)

**General Education/Core Curriculum Associations**

4 Teamwork: includes the ability to collaborate effectively, consider different points of view, and work with others to support a shared purpose or goals.

**Strategic Plan Associations**

Lamar University

14.1 To offer undergraduate and selected graduate educational experiences of excellence, both curricular and co-curricular, which engage students with faculty and staff to meet their diverse needs. (Recruitment, retention, financial support, distance education, curriculum, academic excellence, student engagement, communication, and student life)

**Related Measures**

M 6: Observation of Teamwork Skills in Lab

Lab instructors will observe the interaction of students within their lab groups during selected lab times in all the lab sections on the Lamar campus. The instructors will rate each student’s level of achievement based on the uploaded Teamwork rubric. These scores will be averaged for each category and used to determine if the target was met. The scores are as follows: 1 = Below Expectations, 2 = Meets Expectations, 3 = Exceeds Expectations.

Source of Evidence: Academic direct measure of learning - other

**Connected Document**

GEOL 1403 Outcome 4: Teamwork Rubric

**Target:**

The average of all the students in each category is expected to be greater than or equal to 2.0 to meet the target. If the average in one or two of the categories falls below 2.0, then the target is partially met. If the average in all three categories falls below 2.0 then the target was not met.