

**Core Curriculum  
Course Proposal Cover Sheet**

Department – Chemistry and Geosciences  
College – Science and Technology  
Department Head – Dr. Arthur Low

Course Prefix & Number – ES 210-3  
Course Title – Earth Systems Science  
Course Description – Earth Systems Science (3-2). Introduction to the nature and evolution of the Earth, hydrosphere, atmosphere and Solar System. Prerequisite: PHYS 102 and CHEM 102. Enrollment in this course is restricted to Interdisciplinary Studies majors. Course fee \$10. Lab fee \$10.

**THECB Foundational Component Area for which this course is being submitted.**  
Life and Physical Sciences

**Checklist:**

Course Proposal Cover Sheet  
Foundational Component Area Justification Form  
Student Learning Outcome Alignment Form

## **LIFE AND PHYSICAL SCIENCES**

### **FOUNDATIONAL COMPONENT AREA JUSTIFICATION FORM**

Rationale: Please provide a rationale for the course which explains how the course being proposed fits into this component based on the component's description. For your convenience, the overall description and rationale for this component are included below.

Life and Physical Sciences (from THECB Chapter 4: 4.28)

Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method.

Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

The following four Core Objectives must be addressed in each course approved to fulfill this category requirement: Critical Thinking Skills, Communication Skills, Empirical and Quantitative Skills, and Teamwork.

- Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information;
- Communication Skills: to include effective development, interpretation and expression of ideas through written, oral and visual communication;
- Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions;
- Teamwork: to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

**Rationale for Inclusion in this Category:** The Earth Science Course describes, explains, and predicts natural phenomena using the scientific method in the areas of Geology, Meteorology, Oceanography and Astronomy. In addition, this course reveals how these sciences are applied to human activities and experiences, especially in the utilization of natural resources, weather and climate phenomena and their importance in human activities, and the interaction of humans with Earth ecosystems.

**STUDENT LEARNING OUTCOME ALIGNMENT FORM**  
**Life and Physical Sciences**

**Course Prefix/Number:** ES 210

**Course Title:** Earth Systems Science

**Core Objective: Critical Thinking** CT1: Students will evaluate evidence in analysis, interpretation or arguments.

Course SLO(s): The student will analyze and interpret data for identification of minerals and rocks.

Learning Activities: Earth Science lab exercises on minerals, igneous rocks, sedimentary rocks and metamorphic rocks.

Means of Assessment: Questions on lab sheets.

**Core Objective: Critical Thinking** CT2: Students will synthesize varied components of information to form a rational conclusion.

Course SLO(s): The student will analyze geologic maps to form rational conclusions concerning geologic structures and geochronology.

Learning Activities: A geologic map and geochronology lab will be utilized in this core objective. The student will analyze geologic maps to determine types of geologic structures (including their characteristics and mode of formation) and determination of geochronology (sequencing geologic events and how geochronology is utilized in formulating Earth history).

Means of Assessment: Questions on lab sheets.

**Core Objective: Communication** C1: Students will express ideas in written, visual or oral forms to a range of diverse audiences in multiple settings.

Course SLO(s): Each student will present a demonstration/lab experiment on an aspect of Earth Science, which may include topics in Astronomy, Geology, Meteorology or Oceanography.

Learning Activities: Each student will prepare a unique experiment/demonstration, prepare a handout to be available for each member of the class, and prepare and deliver an oral presentation on the topic.

Means of Assessment: The student will be graded on the quality and accuracy of the handout (40%), the oral presentation (40%) and creativity (20%).

**Core Objective: Empirical and Quantitative** EQS1: Students will gather, interpret or use

numerical data/observable facts to arrive at an informed conclusion.

Course SLO(s): Students will be able to gather and analyze meteorological data to determine current weather conditions and interpret data presented on weather maps.

Learning Activities: Two meteorology labs will be utilized. In the first lab the student will gather, analyze and interpret current weather data on temperature, relative humidity, wind speed and direction, barometric pressure, and precipitation. In the second lab the student will analyze station models on weather maps depicting present meteorological conditions and provide a prognosis of possible future weather conditions.

Means of Assessment: Lab handouts will be provided for each lab. On these handouts the student will record their data, analyses and predictions of current and future weather.

**Core Objective: Teamwork** TW1: Students will work in coordination to complete specific tasks.

Course SLO(s): Students will work in coordination in labs to complete specific tasks.

Learning Activities: Coordination within lab groups which will be assigned for each lab.

Means of Assessment: A rubric will be used for peer evaluation during the semester. Impact of group work will be evaluated by assessing individual performance versus group performance on lab scores.

**Additional objectives at the discretion of the department.**

As department head, I will ensure that all faculty that teach this course are aware of the requirements that these core objectives and learning strategies be incorporated into the above referenced course. This action is taken so that Tarleton State University will be in compliance with Texas Higher Education Coordinating Board foundational component area and core objective requirements for the General Education Core Curriculum.

Signature \_\_\_\_\_

We, the undersigned faculty, support the proposed changes to this course and agree to incorporate them into our section of the above referenced course. This action is taken so that Tarleton State University will be in compliance with Texas Higher Education Coordinating Board foundational component area and core objective requirements for the General Education Core Curriculum.

(Signed document should be kept in department office, listing names below on the electronic document implies acceptance)

Phillip A. Murry