Geoscience Student Learning Outcomes Assessment Plan

Indiana University of PA

PROG - Geoscience

PROG - Geoscience

Student Learning Objective: A.1. Quantitative Tools

Students will be able to analyze earth science problems using quantitative tools.

Assessment Year: 10-11
Action Status: Active

Key Success Indicator

Indicator	Expected Outcome	Source of Data	Active
Introductory courses GEOS 201 and 202 will assess students with graded problem-solving modules	75% of students in GEOS 201 and 201 will successfully complete all problem-solving modules		Yes
Capstone courses GEOS 470/ 480 or EDUC 441 (student teaching) will assess students with detailed rubrics.	90% of students in capstone courses will be rated Highly Accomplished or Accomplished on the quantitative skill column of their presentation rubric.		Yes

Related Courses

* GEOS 201 - Foundations of Geology
* GEOS 202 - Quantitative Methods in Geoscience
* GEOS 302 - Structural Geology
* GEOS 480 - Geoscience Seminar

Related Goals

Academic Affairs - College of Natural Sciences and Mathematics

* NSM-1A. Create student learning activities that lend themselves to possible solutions through the use of science, mathematics, and technology
* NSM-1B. Create student learning activities that require different scientific and algorithmic techniques and practical application of those techniques for their resolution
* NSM-1D. Create student learning activities that require development of strategies and problem solving skills

Academic Affairs - Liberal Studies

* LBST 3. Students will understand and be able to effectively analyze numerical data.
* LBST-5. Students will understand modes of scientific inquiry and the effective use of the scientific method.

Strategic Alignment

* Academic Excellence - G. Foster Achievement of Student Learning Outcomes

PROG - Geoscience

* Geoscience majors will develop the knowledge and skill base needed to excel as professional geologists or earth science educators, and will learn how to communicate their knowledge effectively to others

Student Learning Objective: A.2. Critical Thinking

Students will be able to analyze earth science problems using critical thinking.

Assessment Year: 10-11
Action Status: Active

Key Success Indicator

Indicator	Expected Outcome	Source of Data	Active
Introductory courses GEOS 201 and 202 will assess students with graded problem-solving modules	75% of students in GEOS 201 and 201 will successfully complete all problem-solving modules		Yes
Capstone courses GEOS 470/ 480 or EDUC 441 (student teaching) will assess students with detailed rubrics.	95% of students in capstone courses will be rated Highly Accomplished or Accomplished on the critical thinking column of their presentation rubric.		Yes

Related Courses

* GEOS 201 - Foundations of Geology
* GEOS 202 - Quantitative Methods in Geoscience
* GEOS 302 - Structural Geology

Related Goals

Academic Affairs - College of Natural Sciences and Mathematics

* NSM-1D. Create student learning activities that require development of strategies and problem solving skills

Academic Affairs - Liberal Studies

* LBST-1. Students will develop modes of thought involving inquiry, abstract logical thinking, critical analysis, synthesis, decision making, and other aspects of the rational process
* LBST-50 rg (process)T 1 0 cm [] 0of 0 0 0 rts ot involviET 1 tifberct logicts o 0 geffitical usel

Key Success Indicator			
Indicator	**Expected Outcome**	**Source of Data**	**Active**
Introductory courses (GEOS 201 and 203) will assess student mastery of core concepts in plate tectonics, evolution and environmental change with graded short writing assignments.	75% of students will demonstrate at least a satisfactory knowledge of plate tectonics, evolution and environmental change in their short writing assignments.		Yes
Students in upper-level geoscience courses will demonstrate a deeper understanding of plate tectonics, evolution and environmental change through term papers and / or essay exams.	90% of upper-level students will achieve a satisfactory grade on plate tectonics, evolution and environmental change in their term papers or essay exams		Yes

Related Courses

* GEOS 201 - Foundations of Geology
* GEOS 302 - Structural Geology

Related Goals

Academic Affairs - College of Natural Sciences and Mathematics

* NSM-1G. Create student learning activities that develop an understanding of the basic community of all scientific disciplines which allows the knowledge and skills to be used for improvement of humankind's condition.

Academic Affairs - Liberal Studies

* LBST-5. Students will understand modes of scientific inquiry and the effective use of the scientific method.

Strategic Alignment

* Academic Excellence - G. Foster Achievement of Student Learning Outcomes

PROG - Geoscience

* Geoscience majors will develop the knowledge and skill base needed to excel as professional geologists or earth science educators, and will learn how to communicate their knowledge effectively to others

Student Learning Objective: C.1. Rock and Mineral ID

Students will demonstrate the ability to correctly identify the major rock-forming minerals and the main types of rocks that make up the Earth's crust.

Assessment Year: 10-11
Action Status: Active

Key Success Indicator			
Indicator	**Expected Outcome**	**Source of Data**	**Active**
Rock and mineral identification will be assessed by lab exams in GEOS 201, GEOS 301 and observations in field workshops	Students in GEOS 201 will correctly identify at least 50% of major minerals and rock types; students in GEOS 302 will correctly identify at least 65% of major minerals and rock types; students in field workshops will		Yes

Key Success Indicator			
Indicator	**Expected Outcome**	**Source of Data**	**Active**
	correctly identify at least 8-% of major minerals and rock types.		

Related Courses

* GEOS 201 - Foundations of Geology
* GEOS 302 - Structural Geology

Related Goals

Academic Affairs - College of Natural Sciences and Mathematics

* NSM-1A. Create student learning activities that lend themselves to possible solutions through the use of science, mathematics, and technology
* NSM-2A. Provide students with traditional and modern classroom and laboratory experiences to create an accomplished learning community.

Academic Affairs - Liberal Studies

* LBST-5. Students will understand modes of scientific inquiry and the effective use of the scientific method.

Strategic Alignment

* Academic Excellence - G. Foster Achievement of Student Learning Outcomes

PROG - Geoscience

* Geoscience majors will develop the knowledge and skill base needed to excel as professional geologists or earth science educators, and will learn how to communicate their knowledge effectively to others

Student Learning Objective: C.2. Field Journals

Students will be able to keep detailed and accurate field notes in written journal form

Assessment Year: 10-11
Action Status: Active

Key Success Indicator			
Indicator	**Expected Outcome**	**Source of Data**	**Active**
Field journal note-keeping will be assessed by detailed rubric grades in GEOS 201, GEOS 302 and all field workshops	75% of GEOS 201 students will achieve a score of C or higher on their field rubric. 50% of GEOS 302 students will achieve a score of B or higher on their field rubric. 75% of field workshop students will achieve a score of B or higher on their field rubric.		Yes

Related Courses

* GEOS 201 - Foundations of Geology

Related Goals

Academic Affairs - College of Natural Sciences and Mathematics

* NSM-1B. Create student learning activities that require different scientific and algorithmic techniques and practical application of those techniques for their resolution

* NSM-2C. Prepare students to become lifelong learners and leaders in their respective fields.

Academic Affairs - Liberal Studies

* LBST-5. Students will understand modes of scientific inquiry and the effective use of the scientific method.

Strategic Alignment

* Academic Excellence - G. Foster Achievement of Student Learning Outcomes

PROG - Geoscience

* Geoscience majors will develop the knowledge and skill base needed to excel as professional geologists or earth science educators, and will learn how to communicate their knowledge effectively to others

Student Learning Objective: C.3. Brunton Compass

All students will be able to effectively use a Brunton Compass to measure the strike and dip of rocks, faults or other features

Assessment Year: 10-11
Action Status: Active

Key Success Indicator

Indicator	Expected Outcome	Source of Data	Active
Introductory and appropriate upper-class lab exams will have at least three questions per semester which require Brunton Compass use to answer.	At the freshman level, 80% of students will correctly answer at least two of the three questions. At the upper-class level, 80% of students will correctly answer all of the Brunton Compass questions.	Laboratory Exam Summary Statistics (from instructors); no student identifiers.	Yes

Key Success Indicator

Indicator	Expected Outcome	Source of Data	Active
Students will develop the communication skills needed to present the results of either a research project or a student teaching unit in oral form before peers.	95% of all students will successfully communicate the results of their capstone research or student teaching unit to their peers.		Yes
Students will effectively convey geological content knowledge and the results of their own undergraduate research in a mock-interview format.	At least 80% of students will be able to convey their knowledge of basic geologic content and the results of their own scientific research to a mock-interview committee made up of alumni and professors.	Faculty rubrics (individual student outcomes) and alumni feedback (general student outcomes)	Yes

Related Courses

* GEOS 470 - Research Methods in the Geosciences
* GEOS 480 - Geoscience Seminar

Related Goals

Academic Affairs - College of Natural Sciences and Mathematics

* NSM-3A. Create an environment in which faculty members and students are expected to contribute to new knowledge through research and by communicating their results to the scientific community.

Academic Affairs - Liberal Studies

* LBST-2. Students will acquire literacy in the areas of writing, reading, speaking and listening.

Strategic Alignment

* Academic Excellence - G. Foster Achievement of Student Learning Outcomes

PROG - Geoscience

* Geoscience majors will develop the knowledge and skill base needed to excel as professional geologists or earth science educators, and will learn how to communicate their knowledge effectively to others