#### **Course Outcomes Guide**

Directions: Please complete this form to document your progress toward improving student learning. For each item, indicate your progress and your anticipated next steps. Thank you!

Course/Program Title: PHS 107/108 Date: June 2017

**Introductory Physical Geology** 

Course/Program Team: Nancy Thorpe and Adjuncts: A. Spanos, C. Burch

## **Expected Learning Outcomes**

- Demonstrate knowledge of the scientific method by investigating and solving real-world geologic problems.
- Discover the role of the various spheres of our earth's system and learn how the interactions between these components and the composition of the earth affect the world around us.
- Use technology to learn about geological processes and monitor real-time events such as volcanoes, earthquakes, and floods.
- Apply course content to environmental and human health related issues (e.g. earthquakes, volcanoes, and air and water pollution.)
- Access, process, analyze, and synthesize scientific information.

**Assessment** (How do or will students demonstrate achievement of each outcome? Please attach a copy of your assessment electronically.)

- 1. In-class exams with combination of multiple-choice, short answer, and essay.
- 2. Written laboratory worksheets with a grading rubric.
- 3. Written laboratory mid-term and final exams.
- 4. Research papers on environmental and human health issues.
- 5. Geologic hazard problem solving using Hazard City software.
- 6. Common 100 multiple choice question final exam developed by the team.

**Validation** (What methods have you used or will you use to validate your assessment?) We have developed a common final exam that consists of 100 multiple choice questions and also a general education assessment consisting of 10 multiple choice questions. They were both first implemented in Fall 2012.

**Results** (What do your assessment data show? If you have not yet assessed student achievement of your learning outcomes, when is assessment planned?)

Please see Data Table 1 for results of the common final exam. Data Table 2 provides more detailed information regarding students taking this course. Areas of weakness noted by general education assessment are interpreting graphs and problem solving. Areas of weakness noted from the common final include being able to apply scientific knowledge to real world situations (Learning Outcome 1).

Spring '14 semester of PHS108 implemented for the first time an online lecture format and an online laboratory format.

**Follow-up** (How have you used or how will you use the data to improve student learning?) Individual instructors will receive the analysis of exam results to see areas of weakness and determine best way to emphasize those areas. One suggestion is to look at more current events and make connections to what they are learning. Instructors will also include more graphing assignments into the coursework. Continued use of and more emphasis will be placed on the geologic hazard problem solving assignments.

One section of the course was taught online in spring 2013 and the exam results from the two sections seem fairly comparable. The online homework systems and the online Hazard City Program seem to be effective for introducing technology into the course as well as, emphasizing the content of the course.

We will continue to evaluate the online course and laboratory component over the next year. Since these courses, 107 and 108, are taught by adjuncts, it is sometimes difficult to collect necessary data. We will work on developing a computerized database for easier collection.

There seems to be a pattern, just like in chemistry, the spring semester scores are lower than the fall semester scores. We are not sure of why that is true. For the year 2016-2017, it appears that the face-to-face section without the lab course, CHM107, has achieved higher common final exam scores than the online course with the online lab, CHM108. We will continue to monitor the scores and determine what works best and modify the courses.

Spring 17 COG revision is the first time we have split the data for 107 and 108. All the past years are combined totals for the two courses. We will continue to update the data as individual courses in the future.

**Budget Justification** (What resources are necessary to improve student learning?) We will need resources to purchase any standardized exams we decided to use.

# Science Gen Ed Course \_\_ PHS107/108 – Introductory Physical Geology

<b>General Education Outcomes</b>	Explain how your course achieves each outcome
for Science	
Relate a basic core of scientific	** Course SLO's – 1, 2, 4
principles to an open-ended	Hazard City assignments
framework	Quiz and test questions
	Essay questions on exams
	Dimension Stone Activity
Demonstrate observational and	SLO <sub>20</sub> 1.2.2
	SLO's – 1, 2, 3
analytical skills in a structured situation	Hazard City assignments
Situation	Plate Tectonic Assignment Mineral and Rock identification activities
	Quiz and test essay questions Various worksheets completed in class
	Laboratory work
Formulate conclusions based	SLO's – 1, 3, 4
on observations and	, ,
information	Hazard City assignments Geology and Human Health written paper assignment
Information	Essay questions on exams
	Laboratory reports
	Standardized Physical Geology final exam
	Standardized Filysical Geology Illiai exam
Use technology to access	SLO's – 1, 3, 4
scientific information, generate	Hazard City assignments
and analyze empirical data, and	Google Earth assignments
solve problems	Use of Blackboard for course
•	Use of various website for real-time data on earthquake,
	volcanoes, and floods
	On-line mineral and rock identification keys
	Various laboratories – GIS lab

### \*\* STUDENT LEARNING OUTCOMES:

At the completion of this course, students should be able to:

- 1. Demonstrate knowledge of the scientific method by investigating and solving real-world geologic problems.
- 2. Discover the role of the various spheres of our earth's system and learn how the interactions between these components and the
  - composition of the earth affect the world around us.
- 3. Use technology to learn about geological processes and monitor real-time events such as volcanoes, earthquakes, and floods.
- 4. Apply course content to environmental and human health related issues (e.g. earthquakes, volcanoes, and air and water pollution.)

Data Table 2

Course: PHS107/108 SLOA Data Faculty Team: N. Thorpe

Course. Tristo	- 7					OA Data Tac				carry realist in thorpe			
	SU	FA	SP	SU	FA	SP	SU	FA	SP	FA	SP		
	2012	2012	2013	2013	2013	2014	2014	2014	2015	2015	2016		
# Active students		35	31		40	32		33	34				
%W		0	3.2			6.3							
*% walk-away Fs No final exam/grade = F		4.3	9.7			15.6		12.1	5.9				
% Success (A,B,C)		97.8	76.0			78.2							
Mean Common Lab Practical Score								82.5	75.8	84.1	86.1		
Common Comprehensive Final Exam Score		77.6	89.8		79.5	77.0		74.5	81.7	75.0	84.4		
Gen Ed Assessment		8.21/10	8.5/10			9.1/10		91.1	85.8	74.1	86.1		
Mean course grade		83.8	76.12		74.5	78.0							
Item Analysis Weakest Content Areas		**	**										

<sup>\*%</sup> Walk-away Fs = Did not take the final exam and received a grade of F.

#### **Content Areas**

<sup>\*\*</sup>Weak area: interpolation of graph to access data; math analysis of data. Same areas for each semester.

**Data Table 3** 

Course: PHS107 SLOA Data Faculty Team: N. Thorpe and adjuncts

Course. Triste			'	JLUA D	ata		racarty reams in morpe an					
	FA 2016	SP 2017	SU	FA	SP	SU	FA	SP	FA	SP		
# Active students												
%W												
*% walk-away Fs No final exam/grade = F	16.7	0										
% Success (A,B,C)												
Common Comprehensive Final Exam Score	86.7	85.4										
Gen Ed Assessment	75.6	76.7										
Item Analysis Weakest Content Areas												

<sup>\*%</sup> Walk-away Fs = Did not take the final exam and received a grade of F.

### **Content Areas**

<sup>\*\*</sup>Weak area: interpolation of graph to access data; math analysis of data. Same areas for each semester.

Data Table 4

Course: PHS108 SLOA Data Faculty Team: N. Thorpe and adjuncts

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	FA 2016	SP 2017	FA	SP					
# Active students									
%W									
*% walk-away Fs	6.23	5.6							
% Success (A,B,C)									
Mean Lab Score	81.7	75.5							
Common Comprehensive Final Exam Score	74.4	68.3							
Gen Ed Assessment	81.9	75							
Item Analysis Weakest Content Areas									

<sup>\*%</sup> Walk-away Fs = Did not take the final exam and received a grade of F.

# **Content Areas**