

Framingham State University

Program Assessment Plan for Earth Science Major 2016-2021

Assessment Coordinator:	L. W. McKenna III, Ph. D. lmckenna1@framingham.edu
Department Chair:	V. Singh, Ph. D. vsingh@framingham.edu
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1) PROGRAM MISSION STATEMENT

The mission of the Earth Science major is to equip undergraduate students with a comprehensive understanding of Earth Systems (geosphere, biosphere, hydrosphere, cryosphere, and atmosphere) to address environmental challenges at local, regional, and global levels. The program offers experiential, collaborative, laboratory, field, capstone, and seminar learning opportunities. Graduates of the program will be well positioned to pursue either graduate studies, professional employment, or teaching at the elementary or secondary levels. The goal of the major is to produce well-educated, enlightened citizens, who can reason cogently, communicate clearly, and solve problems¹.

2) PROGRAM LEARNING OBJECTIVES

1. *Content Knowledge*: demonstrate comprehensive knowledge of Earth's geosphere, biosphere, hydrosphere, cryosphere, and atmosphere.
2. *Field methods*: appropriately use a variety of tools and resources to collect data in the field.
3. *Research methods*: independently integrate laboratory, field and literature data to support a thesis.
4. *Communication methods*: communicate scientific data, ideas, and interpretations (through written, oral, visual, and digital means).
5. *Critical thinking*: think critically about environmental challenges at local, regional, and global levels.
6. *Ethics*: evaluate the ethical issues at the intersection of society and the environment.
7. *Education coordinate majors*: pass the appropriate MTEL examination which qualifies them to teach Earth Science at the elementary or secondary level.

These learning objectives were drafted by the program coordinator (McKenna), further developed and honed by Earth Science faculty (Leaffer, Campbell), then edited by the entire PES faculty with the aid of the FSU Director of Assessment. These provisional objectives were refined by a STEM-faculty assessment group.

¹ Mathematical Association of America. 1998. Quantitative Reasoning for College Graduates: A Complement to the Standards. Mathematical Association of America.

3) LEARNING OPPORTUNITIES (key follows on next page.)

Earth Science Major, 4/13/16			Content	Methods			Approach		Profession	
Prefix	Number	Title	Content Knowledge	Field methods	Research methods	Communication methods	Critical thinking	Ethics	Education coordinates	
EASC	131	CwtE	Developmental Level Learning Activity Assessment	E		I	I	I	E	I
EASC	241	Meteor	Developmental Level Learning Activity Assessment	R	I		I			R
EASC	246	Ocean	Developmental Level Learning Activity Assessment	R	I		I			R
ENVS	101	Envi Sci	Developmental Level Learning Activity Assessment	I			I		E	
GEOL	232	Historical	Developmental Level Learning Activity Assessment	R	I	R	R	R		R
ASTR	220	Solar System	Developmental Level Learning Activity Assessment	I						R
ASTR	230	Stars Galaxies	Developmental Level Learning Activity Assessment	I						R
CHEM	107	Chem 1	Developmental Level Learning Activity Assessment	R		R	R	R		R
CHEM	108	Quant	Developmental Level Learning Activity Assessment	E		E	E	E		
GEOL	231	Physical	Developmental Level Learning Activity Assessment	E	I	R		R		E
GEOL	233	Envi. Geol.	Developmental Level Learning Activity Assessment	R	I	I	I	R	R	
MATH	200	Pre-calc	Developmental Level Learning Activity Assessment	E				E		E
PHYS	201	Intro Physics	Developmental Level Learning Activity Assessment	E						
ENVS	202	Stats for Science	Developmental Level Learning Activity Assessment	R		R	R	R	R	
GEOL	XXX	Field Methods	Developmental Level Learning Activity Assessment	R	E	R	R	R	R	
EASC	390	Special Topics	Developmental Level Learning Activity Assessment	E		E	E	E	E	
EASC	450	Capstone	Developmental Level Learning Activity Assessment	E		E	E	E	E	

Key to map:

The vertical axis displays the courses all majors are required to complete. Classes in *italic* typeface are new. Classes are listed roughly by order of completion in the curriculum.

The horizontal axis contains the four kingdoms of learning objectives. These are sub-divided into phyla as indicated in **bold** typeface.

Cells within the map indicate through color and abbreviation the level of development developed in each class:

Introduced	I
Reinforced	R
Emphasized	E
Assessed	A

4) ASSESSMENT METHODS AND TIMELINE

Indicate when and how program learning objectives will be assessed. Refer to the curriculum map to draft a student learning outcomes assessment timeline. It is recommended that you outline a 5-year plan for assessment in which you will assess all of your PLOs.

Academic Years	Outcome(s)	Course(s)	Assessment Evidence (direct/indirect)	Assessment Method	Responsibility
<i>WHEN</i>	<i>WHICH outcome(s) will you examine in each period (Use number)?</i>	<i>WHERE will you look for evidence of student learning (i.e., list course(s) that will generate evidence for each objective.</i>	<i>WHAT student work or other evidence will you examine in order to assess each objective?</i>	<i>HOW will you look at the evidence; what means will you use to analyze the evidence collected for each objective</i>	<i>WHO will oversee collecting, analyzing, reporting, results? List names or titles.</i>
Year 1 (2016-2017) <i>Report 1/18</i>	Content Knowledge	Capstone, Special Topics, PHYS 201, ENVS 202	Research paper, multiple presentations, lab reports, problem sets	Rubrics (TBD), answer keys	McKenna, Singh, other ES faculty
Year 2 (2017-2018) <i>Report 1/19</i>	Communication Methods & Critical Thinking	Capstone, Special Topics, ENVS 202	Research paper, multiple presentations, lab reports, problem sets	Rubrics (TBD), answer keys	“
Year 3 (2018-2019) <i>Report 1/20</i>	Research Methods	Capstone, Special Topics, CHEM 108, ENVS 202, MATH 200	Research paper, multiple presentations, lab reports, problem sets	Rubrics, rubrics, rubrics, answer keys	“
Year 4 (2019-2020) <i>Report 1/21</i>	Field Methods & Ethics	ENVS 101, CwtE, Capstones, “Field methods” class (GEOL XXX)	Research paper, problem sets, examination questions	Rubrics, rubrics, answer keys	“
Year 5 (2020-2021) <i>Report 1/22</i>	Aggregation, analysis, writing and publishing	NA	NA	NA	“

Program Size and Sampling Technique

- a. *State the number of students in the program or the number who graduate each year.*
Currently 12. Current year (2015-2016) is inaugural year of program.
- b. *Describe the sampling technique to be used*
Complete population

5) PLAN FOR ANALYZING RESULTS

- *List who is responsible for distributing results and who will receive results?*
McKenna (Assessment Coordinator)
All PES faculty.
- *State how and at which forums discussion of results will take place.*
See below.

6) DISTRIBUTION. The program will distribute or publish these items in the following ways:

<i>ITEM</i>	<i>Distribution Method</i>					
	FSU Catalog (provide section title)	Website (provide URL)	Annual Reports	Brochures	Course Syllabi	Other (please describe, e.g. department meeting, advising session)
Program Mission	Yes	Yes	Yes	Perhaps	No	Dept. Meeting, Bulletin Board
Program Learning Objectives	Yes	Yes	Yes	Perhaps	No	Dept. Meeting, Bulletin Board
Learning Opportunities (Curriculum Map)	Yes	Yes	Yes	Perhaps	No	Dept. Meeting, Bulletin Board
Assessment Plan	Yes	Yes	Yes	Perhaps	No	Dept. Meeting, Bulletin Board

Attach any rubrics or instrumentation that you plan to use for assessment of Program Learning Objectives

Rubrics are in the “to be determined” stage. They will be developed by the Assessment Coordinator in consultation with faculty in each course, beginning in Fall 2016.

¹ If you have questions or need assistance, please contact Dr. Mark Nicholas, Director of Assessment at mnicholas1@framingham.edu or 508-626-4670

² Accredited programs can provide supplemental documents that indicate the answers to these questions as long as specific page references are provided in each cell of the tables in this form. When the answers are not accessible in that way, please cut and paste into your assessment plan.

Credits: This Template was developed using ideas from templates developed at University of Rhode Island and University of Hawaii in Manoa.