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## **PROGRAM ASSESSMENT MANUAL**

**Revised 5/13/2021**

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# PROGAM ASSESSMENT

## Overview

Program assessment at Essex County College is a collaborative process engaged in by academic program coordinators, faculty, and the Office of Institutional Effectiveness, Planning, and Assessment (IEPA). Academic programs are provided with a systematic process for measuring student learning outcomes, monitoring curricular alignment between course-level and program-level outcomes, and for using assessment results in a systematic and sustained process of continual quality improvement. The process is available to all programs at the College along with ongoing guidance and support from the Office of IEPA. Programs without accreditation by a professional organization in their discipline should utilize this process as per our accreditation agreement with the Middle States Commission on Higher Education. Programs with professional accreditation are encouraged to meet with IEPA to discuss how this process might support their accreditation efforts.

ECC's program assessment model is characterized by the following characteristics:

- The process is designed for assessment at the **program level** and does not cover assessment of learning at the course level.
- The process is designed for **summative assessment** and measures how well students are able to demonstrate achievement of learning outcomes ***upon completion of the program***.
- This process utilizes **direct measures** of student learning by assessing actual samples of student work. Examples include: exams/tests, papers, projects, presentations, performances, field/clinical evaluations, etc.

Because direct measures capture what students can actually do, they are the foundational for assessing student learning. Only once programs have successfully implemented a process using direct measures will they be encouraged to incorporate indirect measures to complement their direct measures and build a more holistic view of learning and achievement. Indirect measures, include perception data such as graduate and alumni surveys.

Implementation of program assessment will be undertaken in a series of four steps. Each step will begin with a meeting that takes place between the assessment coordinator(s) and the Office of IEPA. Each meeting will each have clearly outlined objectives and will end with a short but important list of action-items that will need to be completed before moving on to the next step in the process. Each step will end with the completion of pages in the Annual Assessment Template. The pages in the Annual Assessment Template not only serve as essential building blocks in the assessment process, they also serve as demonstrable evidence to accreditors and stakeholders that the program is engaged in an effective and sustainable process for gauging program effectiveness. The four steps of the program assessment implementation process are as follows:

- Step 1: Creating the Curriculum Map
- Step 2: Curricular Alignment
- Step 3: Data Collection
- Step 4: The Action-Planning Process

# PROGAM ASSESSMENT

## Step 1: The Curriculum Map

### Meeting Objectives:

- IEPA will give the assessment coordinator(s) a broad overview of the program assessment process.
- IEPA will give guidance and instruction on completing the first 4 pages of the Annual Assessment Template

### Follow-up Actions:

After this meeting, the Program Coordinator will complete the first 4 pages of their Annual Assessment Template before advancing to step 2 of the implementation process.

- Complete Page 1 – General Tab

Enter the program's general information including the program's Mission Statement

*Sample screen shot of a completed page 1 - General*

1	2	3
2	<b>General Program Information</b>	
3		
4	Program Name:	Geology
5	STEM or Non-STEM	STEM
6	Dean:	Dean XYZ
7	Division:	Division of Earth Sciences
8	Chairperson:	Dr. XYZ
9	Program Assessment Coordinator:	Dr. XYZ
10	Degree (AA, AS, AAS, Certificate)	A.A.S
	Program Mission and Goals	<p>The mission of the Geology A.A.S. program at Essex County College is to provide a broad yet rigorous geologic education that allows students to develop scientific thinking skills with particular emphasis on field-based research and active geologic processes. Geology education at Essex County College will focus on developing students ability to recognize and describe geologic features, interpret underlying geologic processes, and have a scientifically-based understanding of the interactions between human activities and geologic processes. In addition to demonstrated achievement of the program's learning outcomes by graduates upon completion of the program, the program aims to:</p> <ul style="list-style-type: none"><li>• Provide a solid foundation that provides multiple opportunities for further education and within the field Geology.</li><li>• Serve as a resource to the local scientific community for applied research in the field of geology and in environmental impact reasearch.</li><li>• Provide faculty with the support to pursue research projects that will benefit the community and provide valuable experiential research opportunities for students in the program.</li></ul>

General | Curriculum | PLOs | Curriculum Map | Results | Action Plan | +

*Note: The goals listed on this page are goals of the program, not student learning goals.*

# PROGAM ASSESSMENT

- Complete Page 2 – Curriculum Tab

Enter the program's required courses in the major curriculum.

- ✓ *General Education courses should not be included in this list except for in the rare instance that a major requires a specific General Education course be taken because it introduces or reinforces one or more of the program's learning outcomes.*
- ✓ *Courses should be listed in as close to chronological order as possible, based on pre-requisites.*

Sample screen shot of a completed page 2 - Curriculum

1	2	3																						
1																								
2	<b>Curriculum</b>																							
3	<b>Geology</b>																							
4																								
5	<table border="1"><thead><tr><th>Course Number</th><th>Course Name</th></tr></thead><tbody><tr><td>GEO1010</td><td>Introduction to Geology</td></tr><tr><td>GEO1020</td><td>Foundations of Environmental Geology</td></tr><tr><td>GEO2000</td><td>Minerals and Compounds I.</td></tr><tr><td>GEO2040</td><td>Minerals and Compounds II.</td></tr><tr><td>GEO3010</td><td>Organic Chemistry I.</td></tr><tr><td>GEO3300</td><td>Organic Chemistry II.</td></tr><tr><td>GEO3700</td><td>Plate Tectonics and Earth's Evolution</td></tr><tr><td>GEO4010</td><td>Geologic Field Research I.</td></tr><tr><td>GEO4020</td><td>Geologic Field Research II.</td></tr><tr><td>GEO4060</td><td>Field Research Practicum</td></tr></tbody></table>		Course Number	Course Name	GEO1010	Introduction to Geology	GEO1020	Foundations of Environmental Geology	GEO2000	Minerals and Compounds I.	GEO2040	Minerals and Compounds II.	GEO3010	Organic Chemistry I.	GEO3300	Organic Chemistry II.	GEO3700	Plate Tectonics and Earth's Evolution	GEO4010	Geologic Field Research I.	GEO4020	Geologic Field Research II.	GEO4060	Field Research Practicum
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27																								

General

**Curriculum**

PLOs

Curriculum Map

Results

Action Plan

+

# PROGAM ASSESSMENT

- Complete Page 3 – PLOs

Enter the program's learning outcomes (PLOs)

- ✓ *PLOs are summative, meaning that they describe the knowledge, skills, and abilities that students will obtain upon completion of the program.*

Sample screen shot of a completed page 3 - PLOs

1	2	3
1		
2	<b>Program Learning Outcomes</b>	
3	<b>Geology</b>	
4		
5	<b>Name:</b> <b>Students will be able to:</b>	
6	<b>GEO1</b>	Students will be able to describe the fundamental concepts of geology including the origin, composition, and evolution of the Earth, and how the Earth system responds to internal and external forces, including the forces of humans.
7	<b>GEO2</b>	Students will be able to apply geologic knowledge, scientific research principles, and critical thinking skills to address a range of problems.
8	<b>GEO3</b>	Students will be able to demonstrate interdisciplinary approaches by applying physics, chemistry, biology and mathematics, as appropriate, to understand geological processes.
9	<b>GEO4</b>	Students will be able to utilize computers, field and laboratory equipment, software, and instrumentation appropriate to the field of geology.
10	<b>GEO5</b>	Students will be able to effectively conduct a scientific field research project and communicate research results in both written and oral form.
11		
12		
<div>General   Curriculum   <b>PLOs</b>   Curriculum Map   Results   Action Plan   (+)</div>		

# PROGAM ASSESSMENT

- Complete Page 4 – Curriculum Map

Once pages 2 and 3 are completed, the spreadsheet will automatically create the curriculum map on page 4. The Curriculum Map contains the courses entered on page 2 across the top of the map as the column headers and the PLOs entered on page 3 across the left hand side as the row headers.

- ✓ *To complete the Curriculum Map, Program Coordinators should fill out one row (PLO) at a time. For each PLO, the coordinator should indicate which courses Introduce that outcome and enter an "I", which courses Reinforce that outcome and enter an "R", and which courses there is an expectation that students can Demonstrate Mastery and enter an "M".*

Sample screen shot of a completed page 4 – Curriculum Map

	1	2	3	4	5	6	7	8	9	10	11	12	13
2	<b>Curriculum Map</b>												
3	<b>Geology</b>												
5	<b>I= Introduced</b>												
6	<b>R= Reinforced</b>												
7	<b>M= Demonstration of Mastery</b>												
9				<b>GEO 1010</b>	<b>GEO 1020</b>	<b>GEO 2000</b>	<b>GEO 2040</b>	<b>GEO 3010</b>	<b>GEO 3300</b>	<b>GEO 3700</b>	<b>GEO 4010</b>	<b>GEO 4020</b>	<b>GEO 4060</b>
10	<b>PLO 1</b>	Students will be able to describe the fundamental concepts of geology including the origin, composition, and evolution of the Earth, and how the Earth system responds to internal and external forces, including the forces of humans.	I	R	R		R	R			R	M	
11	<b>PLO 2</b>	Students will be able to apply geologic knowledge, scientific research principles, and critical thinking skills to address a range of problems.		I		R	R		R				M
12	<b>PLO 3</b>	Students will be able to demonstrate interdisciplinary approaches by applying physics, chemistry, biology and mathematics, as appropriate, to understand geological processes.		I		R					R	M	M
13	<b>PLO 4</b>	Students will be able to utilize computers, field and laboratory equipment, software, and instrumentation appropriate to the field of geology.			I		R		R				M
14	<b>PLO 5</b>	Students will be able to effectively conduct a scientific field research project and communicate research results in both written and oral form.	I	R	R		R		R			M	M
<div> <div>General</div> <div>Curriculum</div> <div>PLOs</div> <div><b>Curriculum Map</b></div> <div>Results</div> <div>Action Plan</div> <div>+</div> </div>													

# PROGAM ASSESSMENT

## Step 2: Curricular Alignment

### Meeting Objectives:

- IEPA will walk the Program Coordinator through the process of ensuring curricular alignment between course-level outcomes and program-level outcomes. Program coordinators will be asked to bring a sampling of a few departmental course outlines from courses in their program.
- ✓ Using the Curriculum Map, each course (column) in the map will be evaluated for alignment. For each relationship signified by an I, R, or M, the Program Coordinator will check to ensure there is a corresponding course-level outcome on the course outline. See screen shot below.

		GEO 1010	GEO 1020	GEO 2000
<b>PLO 1</b>	Students will be able to describe the fundamental concepts of geology including the origin, composition, and evolution of the Earth, and how the Earth system responds to internal and external forces, including the forces of humans.	I	R	R
<b>PLO 2</b>	Students will be able to apply geologic knowledge, scientific research principles, and critical thinking skills to address a range of problems.		I	
<b>PLO 3</b>	Students will be able to demonstrate interdisciplinary approaches by applying physics, chemistry, biology and mathematics, as appropriate, to understand geological processes.		I	
<b>PLO 4</b>	Students will be able to utilize computers, field and laboratory equipment, software, and instrumentation appropriate to the field of geology.			I
<b>PLO 5</b>	Students will be able to effectively conduct a scientific field research project and communicate research results in both written and oral form.	I	R	R

### Example:

For GEO 2000

There needs to be a course level outcome on the GEO 2000 course outline indicating that the content of **PLO1** will be reinforced.

There needs to be a course level outcome on the GEO 2000 course outline indicating that the content of **PLO4** will be introduced.

There needs to be a course level outcome on the GEO 2000 course outline indicating that the content of **PLO5** will be reinforced.

*Note: There can be additional course-level outcomes for GEO 2000, But the course outline must contain the three outcomes at a minimum.*

### Follow-up Actions:

After this meeting, the program coordinator will complete this curricular alignment exercise for courses in the curriculum map. The program coordinator will be made aware that going forward, if there are any changes made to the program's curriculum map, this alignment exercise will need to be repeated for the affected courses (columns).



# PROGRAM ASSESSMENT

## Step 3: Data Collection

### Meeting Objectives:

- IEPA will give the program coordinator an overview of how IEPA will collect summative (mastery level) assessment data from faculty in their program.
- All faculty teaching one or more sections of a course where expectation of master is expected for a PLO will receive an electronic form from IEPA for the collection of assessment data (see screenshot below).

### Follow-up Actions:

- The assessment coordinator will not have to do anything during this step other than encouraging their faculty to submit the assessment data requested by IEPA.

*Illustration using the curriculum map showing which instructors will be asked to submit assessment data to IEPA.*

*Note: Since we are conducting summative assessment, only courses with an "M" in the curriculum map will be asked to submit assessment data.*

All instructors teaching one or more sections of **GEO 4020** will receive an electronic form to submit their assessment data for **PLO1, PLO3, and PLO5**

All instructors teaching one or more sections of **GEO 4060** will receive an electronic form to submit their assessment data for **PLO2, PLO3, PLO4, and PLO5**

		GEO 1010	GEO 1020	GEO 2000	GEO 2040	GEO 3010	GEO 3300	GEO 3700	GEO 4010	GEO 4020	GEO 4060
<b>PLO 1</b>	Students will be able to describe the fundamental concepts of geology including the origin, composition, and evolution of the Earth, and how the Earth system responds to internal and external forces, including the forces of humans.	I	R	R		R	R		R	M	
<b>PLO 2</b>	Students will be able to apply geologic knowledge, scientific research principles, and critical thinking skills to address a range of problems.		I		R	R		R			M
<b>PLO 3</b>	Students will be able to demonstrate interdisciplinary approaches by applying physics, chemistry, biology and mathematics, as appropriate, to understand geological processes.		I		R				R	M	M
<b>PLO 4</b>	Students will be able to utilize computers, field and laboratory equipment, software, and instrumentation appropriate to the field of geology.			I		R		R			M
<b>PLO 5</b>	Students will be able to effectively conduct a scientific field research project and communicate research results in both written and oral form.	I	R	R		R		R		M	M

The electronic forms sent to instructors teaching GEO4020 and GEO4060 can be found in the following 5 pages.



## GEO 4020 - Measures and Results

Dear instructor,

You are receiving this form because you are teaching one or more sections of the course **GEO 4020** and this course expects that students are able to demonstrate mastery of one or more program-level learning outcomes. Please use the form below to tell us about the measures (assignments) that you utilize in your course to assess these outcomes, as well as a brief numeric summary of the results for this semester.

**PLO 1 - Students will be able to describe the fundamental concepts of geology including the origin, composition, and evolution of the Earth, and how the Earth system responds to internal and external forces, including the forces of humans.**

**\* Measure Description:**

Please describe in detail, the measurement tool that was used to assess whether students are achieving mastery of this program-level learning outcome.

**\* Summary of Results**

Please give the two requested numbers below. If you teach more than one section of this course, please combine all sections together.

How many students took this measure?

How many students met the target?

**PLO 3 - Students will be able to demonstrate interdisciplinary approaches by applying physics, chemistry, biology and mathematics, as appropriate, to understand geological processes.**

**\* Measure Description:**

Please describe in detail, the measurement tool that was used to assess whether students are achieving mastery of this program-level learning outcome.

**\* Summary of Results**

Please give the two requested numbers below. If you teach more than one section of this course, please combine all sections together.

How many students took this measure?

How many students met the target?

**PLO 5 - Students will be able to effectively conduct a scientific field research project and communicate research results in both written and oral form.**

**\* Measure Description:**

Please describe in detail, the measurement tool that was used to assess whether students are achieving mastery of this program-level learning outcome.

**\* Summary of Results**

Please give the two requested numbers below. If you teach more than one section of this course, please combine all sections together.

How many students took this measure?

How many students met the target?



## GEO 4060 - Measures and Results

Dear instructor,

You are receiving this form because you are teaching one or more sections of the course **GEO 4060** and this course expects that students are able to demonstrate mastery of one or more program-level learning outcomes. Please use the form below to tell us about the measures (assignments) that you utilize in your course to assess these outcomes, as well as a brief numeric summary of the results for this semester.

**PLO 2 - Students will be able to apply geologic knowledge, scientific research principles, and critical thinking skills to address a range of problems.**

**\* Measure Description:**

Please describe in detail, the measurement tool that was used to assess whether students are achieving mastery of this program-level learning outcome.

**\* Summary of Results**

Please give the two requested numbers below. If you teach more than one section of this course, please combine all sections together.

How many students took this measure?

How many students met the target?

**PLO 3 - Students will be able to demonstrate interdisciplinary approaches by applying physics, chemistry, biology and mathematics, as appropriate, to understand geological processes.**

**\* Measure Description:**

Please describe in detail, the measurement tool that was used to assess whether students are achieving mastery of this program-level learning outcome.

**\* Summary of Results**

Please give the two requested numbers below. If you teach more than one section of this course, please combine all sections together.

How many students took this measure?

How many students met the target?

**PLO 4 - Students will be able to effectively conduct a scientific field research project and communicate research results in both written and oral form.**

**\* Measure Description:**

Please describe in detail, the measurement tool that was used to assess whether students are achieving mastery of this program-level learning outcome.

**\* Summary of Results**

Please give the two requested numbers below. If you teach more than one section of this course, please combine all sections together.

How many students took this measure?

How many students met the target?

**PLO 5 - Students will be able to effectively conduct a scientific field research project and communicate research results in both written and oral form.**

**\* Measure Description:**

Please describe in detail, the measurement tool that was used to assess whether students are achieving mastery of this program-level learning outcome.

**\* Summary of Results**

Please give the two requested numbers below. If you teach more than one section of this course, please combine all sections together.

How many students took this measure?

How many students met the target?

# PROGAM ASSESSMENT

- Data will be collected each semester, and will be aggregated by IEPA each year after the conclusion of the Spring semester.
- The aggregated data will be compiled in page 5 (Results) of the Annual Assessment template by IEPA.
- The Annual Assessment Template with the assessment results compiled on page 5 (Results) will be distributed back to the Program Coordinators.
- In addition to the aggregate analysis in the Results tab of the Annual Assessment Template, the Program Coordinators will also receive the disaggregated individual section results in a separate file.

## Sample screen shot of page 5 – Results

### Annual Results Summary Geology

		AY 2020-2021	Fall 2020		Spring 2021		AY 2019-2020
		Target	GEO 4020	GEO 4060	GEO 4020	GEO 4060	Final Results
PLO 1	Students will be able to describe the fundamental concepts of geology including the origin, composition, and evolution of the Earth, and how the Earth system responds to internal and external forces, including the forces of humans.	XX% of students will achieve a score of 75 or higher	N Assessed = N Met Target = % Met Target =		N Assessed = N Met Target = % Met Target =		N Assessed = N Met Target = % Met Target = Target Met (Y/N) =
PLO 2	Students will be able to apply geologic knowledge, scientific research principles, and critical thinking skills to address a range of problems.	XX% of students will achieve a score of 75 or higher		N Assessed = N Met Target = % Met Target =		N Assessed = N Met Target = % Met Target =	N Assessed = N Met Target = % Met Target = Target Met (Y/N) =
PLO 3	Students will be able to demonstrate interdisciplinary approaches by applying physics, chemistry, biology and mathematics, as appropriate, to understand geological processes.	XX% of students will achieve a score of 75 or higher	N Assessed = N Met Target = % Met Target =	N Assessed = N Met Target = % Met Target =	N Assessed = N Met Target = % Met Target =	N Assessed = N Met Target = % Met Target =	N Assessed = N Met Target = % Met Target = Target Met (Y/N) =
PLO 4	Students will be able to utilize computers, field and laboratory equipment, software, and instrumentation appropriate to the field of geology.	XX% of students will achieve a score of 75 or higher		N Assessed = N Met Target = % Met Target =		N Assessed = N Met Target = % Met Target =	N Assessed = N Met Target = % Met Target = Target Met (Y/N) =

# PROGAM ASSESSMENT

## Step 4: Action Planning

### Meeting Objectives:

- Annual assessment results, including the aggregate results on page 5 of the Annual Assessment Template, as well as the individual section results, will be reviewed with the Program Coordinator.

### Follow-up actions:

- Program coordinators will form a small assessment committee consisting of faculty members from the program.
- The assessment committee will review the annual assessment results and using their curriculum map as a reference document, develop appropriate action plans.
  - ✓ Action plans can be programmatic changes such as adjustments to the curriculum, curriculum map, revising course outlines, etc.
  - ✓ Action plans can also be process changes, such as identifying new assessment measures that are better indicators of student learning and re-evaluating PLOs. The inclusion of process changes in the action planning process serves as a mechanism to continually evaluate our assessment process.
- Action plans will be entered into page 6 (Action Plan) in the Annual Assessment Template.
- Based on the annual results, the assessment committee will then update their targets for the upcoming year.

Sample screen shot of page 5 – Results

#### Action Plan Geology

		AY 2020-2021 Targets	AY 2020-2021 Final Results	Action Plan for 2021-2022: Please describe in detail, what, if any, actions will be taken to increase the percentage of students who successfully demonstrate mastery of this outcome.	Updated Targets for 2021-2022
PLO 1	Students will be able to describe the fundamental concepts of geology including the origin, composition, and evolution of the Earth, and how the Earth system responds to internal and external forces, including the forces of humans.	XX% of students will achieve a score of 75 or higher	N Assessed = N Met Target = % Met Target = Target Met (Y/N) =		
PLO 2	Students will be able to apply geologic knowledge, scientific research principles, and critical thinking skills to address a range of problems.	XX% of students will achieve a score of 75 or higher	N Assessed = N Met Target = % Met Target = Target Met (Y/N) =		
PLO 3	Students will be able to demonstrate interdisciplinary approaches by applying physics, chemistry, biology and mathematics, as appropriate, to understand geological processes.	XX% of students will achieve a score of 75 or higher	N Assessed = N Met Target = % Met Target = Target Met (Y/N) =		
PLO 4	Students will be able to utilize computers, field and laboratory equipment, software, and instrumentation appropriate to the field of geology.	XX% of students will achieve a score of 75 or higher	N Assessed = N Met Target = % Met Target = Target Met (Y/N) =		



## Post-Implementation

- After the initial implementation year, IEPA will provide a new Annual Assessment Template each year that will contain the following:
  - ✓ Pages 1-4 will be pre-populated using the information from the prior year.
  - ✓ Pages 5 and 6 will be updated to reflect the newly revised targets from the prior year.
- IEPA will also communicate regularly with assessment coordinators throughout the year to ensure the assessment process is operating smoothly.
- IEPA will also meet annually with each Program Coordinator for a check-in and annual, and more frequently as needed.