

Departmental Assessment for Middle States
Environmental Science

1. Action Items from 2013-2014

Recommendations for improvements include working in the courses in which these concepts are introduced and reinforced to improve student comprehension and ability to apply them in their internship paper. Specifically spending more time on the research paper in the introduction to environmental studies course in the hope to improve the objective communicate effectively on environmental topics and data and the research project paper in applied environmental science in the hope to improve the objectives apply interdisciplinary perspectives and approaches to environmental problems and demonstrate a working knowledge of techniques used to collect and analyze environmental data. Also to improve upon the internship paper a rough draft will be required to be submitted for review and suggestions around the mid-way point of the internship.

Progress in addressing action items

In the foundational courses taken by environmental science freshman, ENSC 111, Introduction to Environmental Science and GEOL 150, Earth Systems, lectures primarily consisting of PowerPoint slides were replaced with lectures in which notes were written on the board and pictures and figures shown on PowerPoint slides with the hopes that students would be more engaged in the course and allowed for questions on topics to be asked to the students and discussions had before information appeared in front of them. In ENSC 111 the research paper was broken down into smaller assignments before the complete paper was due to try to provide more feedback. In the upper level applied environmental science course students were required to present the findings of their previous lab experiment each week as well as more formally present their research project to the class. More time was spent in explanation of what was expected of the research project paper in this course as well. A rough draft was not required of the student's internship papers this year but it was strongly encouraged and suggested to students.

2. Departmental Learning Outcomes

A student who graduates from Thiel College with a major in environmental science will be able to:

- *apply interdisciplinary perspectives and approaches to environmental problems.*
- *demonstrate a working knowledge of techniques used to collect and analyze environmental data.*
- *communicate effectively on environmental topics and data.*

Assessment Activity 2014-2015

The rubric developed last year was applied to three senior internship papers (students 1, 2 and 3) from summer 2014 and spring 2015. Two faculty members (A and B) reviewed each paper and each objective was scored at the novice (N), intermediate (I) or expert (E) level according to the descriptions in the rubric.

3. Summary of Assessment Results

A. Apply interdisciplinary perspectives and approaches to environmental problems

	Objectives									
	Interdisciplinary nature		Defined environmental problem		Clear approach to environmental problem		Critical analysis of environmental problem		Application of interdisciplinary perspective to address environmental problem	
Student	A	B	A	B	A	B	A	B	A	B
1	E	I	I	I	I	I	I	I	I	I
2	E	I	I	I	I	N	I	N	I	N
3	E	I	E	I	E	I	I	I	I	I
% scoring I or E	100	100	100	100	100	66	100	66	100	66

B. Demonstrate a working knowledge of techniques used to collect and analyze environmental data

	Objectives									
	Use of data collection techniques		Data Collection		Use of data analysis techniques		Data analysis		Application of collection and analysis to environmental problem	
Student	A	B	A	B	A	B	A	B	A	B
1	E	N	E	I	I	N	I	N	I	I
2	N	I	N	I	N	N	N	N	N	N
3	E	I	E	I	N	N	I	N	I	I
% scoring I or E	66	66	66	100	33	0	66	0	66	66

C. Communicate effectively on environmental topics and data

	Objectives											
	Topics Presentation		Data Presentation		Reviews Literature		Organization		Writing mechanics		References	
Student	A	B	A	B	A	B	A	B	A	B	A	B
1	I	I	I	I	I	N	E	I	I	I	E	N
2	I	I	N	I	I	N	N	N	I	N	I	N
3	I	I	I	I	I	N	N	N	N	N	N	N
% scoring I or E	100	100	66	100	100	0	33	33	66	33	66	0

4. Reflections

Objectives that were met successfully in which greater than 66% of the students scored at the intermediate or expert level:

Apply interdisciplinary perspectives and approaches to environmental problems

- Interdisciplinary nature
- Defined environmental problem
- Clear approach to environmental problem
- Critical analysis of environmental problem
- Application of interdisciplinary perspective to address environmental problem

Demonstrate a working knowledge of techniques used to collect and analyze environmental data

- Use of data collection techniques
- Data Collection
- Application of collection and analysis to environmental problem

Communicate effectively on environmental topics and data

- Topics Presentation
- Data Presentation

Objectives that need improved upon include the following in which less than 66% of the students scored at the intermediate or expert level:

Demonstrate a working knowledge of techniques used to collect and analyze environmental data

- Use of data analysis techniques
- Data analysis

Communicate effectively on environmental topics and data

- Review literature
- Organization
- Writing mechanics
- References

All parts of the first objective, apply interdisciplinary perspectives and approaches to environmental problems, were met. This is the broadest of the objectives and focuses on the interdisciplinary nature that studying environmental science involves. Students demonstrated the ability to make connections between fields and apply these to their internship experiences. Parts of the next two objectives, demonstrate a working knowledge of techniques used to collect and analyze environmental data and communicate effectively on environmental topics and data were met while others were not. Some internship experiences involve more or less data collection and analysis so these areas are harder to evaluate with this assignment. More effort needs to be made so that students are able to clearly present the findings of their experience and present it as data in whatever way is most appropriate. The area that needs most improvement with data is data analysis, this is crucial to being a scientist, being able to take data and put it in perspective. Answering the “what does it mean” and “why it is important” type questions are difficult and it is clear that our students need to develop this skill further. In terms of communicating effectively it is apparent that our students struggle with this aspect. The writing of these students was difficult to follow and was lacking detail and transitions between topics. These are skills that can be improved upon through practice and many assignments throughout many courses. The outcomes of these specific internship papers could be greatly improved by submission of rough drafts with suggestions given to aid in improvement of these assignments as well as more opportunities to present.

5. Action items for 2015-2016

Reworking of research paper required in ENSC 111, Introduction to Environmental Studies, to have more of an applied focus.

Incorporating more data analysis in laboratory components.

Encouraging students to present projects/papers during the research symposium or other public events.