

**STUDENT LEARNING ASSESSMENT PROGRAM  
SUMMARY FORM AY 2009-2010**

**Degree and Program Name:** B.S. in Geology, Geology Program

**Submitted By:** Kathleen Bower

Please complete a separate worksheet for each academic program (major, minor) at each level (undergraduate, graduate) in your department. Worksheets are due to CASA this year by **June 15, 2010**. Worksheets should be sent electronically to [kjsanders@eiu.edu](mailto:kjsanders@eiu.edu) and should also be submitted to your college dean. For information about assessment or help with your assessment plans, visit the Assessment webpage at <http://www.eiu.edu/~assess/> or contact Karla Sanders in CASA at 581-6056.

**PART ONE**

**Results from geology majors, Spring 2010**

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
1. Geology graduates will develop skills to carry out scientific inquiry in the earth sciences.	Assessment of educational outcomes of Geology majors and minors will be performed before the tenth week of each spring semester. Every student who is a Geology program major will be required to submit their answers anonymously to four assessment questions to the department before they may register for Fall or Summer classes:  1. Based only on the average course level of the courses you took this year in the department (GEL prefix), what level are you? (1000, 2000, 3000, 4000)?  2. List at least 5 of the most important things or skills you learned or continued to	It is expected that students will learn skills in scientific inquiry at the appropriate level and will be able to recognize such learning.	7 geology majors responded to the Geology Program survey; 2 freshmen, no sophomores, two juniors, and 3 seniors  <b>There is no self-reported student feedback on scientific inquiry skills.</b>	Dr. Kathleen Bower is the person responsible for analyzing the student survey results.  Results are shared with all members of the Department of Geology and Geography and with CASL.

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
	<p>develop this academic year as a geology major.</p> <p>3. What connections did you make this year between and among the subjects of the courses required for your geology major?</p> <p>4. What connections did you make this year between and among the subjects of all your courses taken at EIU?</p>			
<p>2. Geology graduates should have a thorough knowledge and understanding of core concepts in the earth sciences including the following areas:</p> <p>2.1 Major physical and historical events of the Earth, and the methods used to interpret these events;</p> <p>2.2 Common mineral, rock, and soil physical processes; the identification and classification of common minerals, rocks, and soils; and their genesis;</p> <p>2.3 Surface geologic processes and their impact on development of landforms, and the ability to identify and interpret landform development;</p> <p>2.4 Basic tectonic processes,</p>	<p>Assessment of educational outcomes of Geology majors and minors will be performed before the tenth week of each spring semester. Every student who is a Geology program major will be required to submit their answers anonymously to four assessment questions to the department before they may register for Fall or Summer classes:</p> <p>1. Based only on the average course level of the courses you took this year in the department (GEL prefix), what level are you? (1000, 2000, 3000, 4000)?</p> <p>2. List at least 5 of the most important things or skills you learned or continued to develop this academic year as a geology major.</p> <p>3. What connections did you make this year between and</p>	<p>It is expected that students will learn geologic principles and skills at the appropriate level and will be able to recognize such learning.</p>	<p>7 geology majors responded to the Geology Program survey; 2 freshmen, no sophomores, two juniors, and 3 seniors</p> <p><b>Students are mastering appropriate material.</b></p> <p><b>Based on student self-reporting, students are learning:</b> Use of backpack GPS system</p> <p>Knowledge in each field of class, sometimes with skills to use knowledge (junior)</p> <p>Stratigraphic interpretation, petrographic microscope identification, thin section preparation, basics of GIS, sequence stratigraphy (senior)</p>	<p>Dr. Kathleen Bower is the person responsible for analyzing the student survey results.</p> <p>Results are shared with all members of the Department of Geology and Geography and with CASL.</p>

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
<p>and the ability to interpret structural relations from geologic data;</p> <p>2.5 Processes occurring at different types of lithospheric plate boundaries</p> <p>2.6 Interactions between and major processes occurring within the major spheres (biosphere, hydrosphere, atmosphere, and geosphere) and cycles (e.g. geochemical) of Earth.</p>	<p>among the subjects of the courses required for your geology major?</p> <p>4. What connections did you make this year between and among the subjects of all your courses taken at EIU?</p>		<p>Optical mineralogy including interference figures, becke lines, + and - elongation, the study of the lunar rocks from NASA, and thin section preparation (senior)</p> <p>Correlation of strata, applied geology in coal and oil exploration, and reading well logs (senior)</p> <p>Need stronger background in environmental geology (senior)</p>	
<p>3. Geology graduates should have a set of fundamental skills that they can apply to a variety of situations, including</p> <p>3.1. Critical thinking skills – the ability to formulate strategies, collect and synthesize data, and apply mathematical and graphical techniques to arrive at solutions, and interpret results related to geological processes;</p> <p>3.2. Development and use of models, visualizations, and three-dimensional conceptualizations;</p> <p>3.3. Communication</p>	<p>Assessment of educational outcomes of Geology majors and minors will be performed before the tenth week of each spring semester. Every student who is a Geology program major will be required to submit their answers anonymously to four assessment questions to the department before they may register for Fall or Summer classes:</p> <p>1. Based only on the average course level of the courses you took this year in the department (GEL prefix), what level are you? (1000, 2000, 3000, 4000)?</p> <p>2. List at least 5 of the most important things or skills you learned or continued to develop this academic year</p>	<p>It is expected that students will learn fundamental principles and skills at the appropriate level and will be able to recognize such learning.</p>	<p><b>Students are mastering appropriate material.</b></p> <p>In Academic Year 2009, majors in the Department of Geology/Geography earned an average Watson-Glaser score of 24.76 (out of 40 points). The COS average is 25.39 and EIU average is 24.61. Geology/Geography majors are below average in COS but above average at EIU in their measured critical thinking ability.</p> <p>In Academic Year 2009, majors in the Department of Geology/Geography earned an average EWP score of 3.45 (4 is highest level out of 4 points). The COS average</p>	<p>Dr. Kathleen Bower is the person responsible for analyzing the student survey results.</p> <p>Results are shared with all members of the Department of Geology and Geography and with CASL.</p>

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
<p>Skills – the ability to clearly express earth science concepts and present results from analysis, laboratory and field work in written, oral, and graphic format.</p> <p>3.4. Global Citizenship - the ability to function as responsible global citizens by making objective decisions informed by multiple perspectives</p>	<p>as a geology major.</p> <p>3. What connections did you make this year between and among the subjects of the courses required for your geology major?</p> <p>4. What connections did you make this year between and among the subjects of all your courses taken at EIU?</p>		<p>is 3.39 and EIU average is 3.38. Geology/Geography majors are above average in COS and EIU in their writing ability. Only the Nursing and the Mathematics &amp; Computer Science programs of the COS have majors with better written communication ability.</p> <p>7 geology majors responded to the Geology Program survey; 2 freshmen, no sophomores, two juniors, and 3 seniors</p> <p><b>Based on student self-reporting, students are learning:</b> Leadership skills (junior)</p> <p>Interpretation of teacher expectations and ability to learn information in courses. There was usually an underlying theme [in courses] or system and information was correlated (junior)</p> <p>[Gained] increased confidence in geology research, oral communication, writing ability and interest in similar fields (junior)</p>	

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
Supplemental Student comments on integrative education	<p>Assessment of educational outcomes of Geology majors and minors will be performed before the tenth week of each spring semester. Every student who is a Geology program major will be required to submit their answers anonymously to four assessment questions to the department before they may register for Fall or Summer classes:</p> <ol style="list-style-type: none"> <li>5. Based only on the average course level of the courses you took this year in the department (GEL prefix), what level are you? (1000, 2000, 3000, 4000)?</li> <li>6. List at least 5 of the most important things or skills you learned or continued to develop this academic year as a geology major.</li> <li>7. What connections did you make this year between and among the subjects of the courses required for your geology major?</li> <li>8. What connections did you make this year between and among the subjects of all your courses taken at EIU?</li> </ol>	<p>It is expected that there will be integrative experiences horizontally and vertically among required geology courses taken by geology majors.</p> <p>It is expected that there will be integrative experiences between all courses taken at EIU and geology courses.</p>	<p>7 geology majors responded to the Geology Program survey; 2 freshmen, no sophomores, two juniors, and 3 seniors</p> <p><b>Based on student self-reporting, students are recognizing:</b> All geology classes are related one way or another (freshman)</p> <p>A high level of horizontal and vertical integration of learning. There were old subjects [student] expanded upon, new subjects to learn, and other classes that ... could [be used] in order to further learn and accomplish my academic obligations (junior)</p> <p>Relation of formation of petrological bodies with aspects of historical geology, geomorphology relating to petrology of weathering outcrops (junior)</p> <p>Use of petrographic microscope to observe crystal properties has really tied together [student] experiences in mineralogy and petrology (senior)</p>	<p>Dr. Kathleen Bower is the person responsible for analyzing the student survey results.</p> <p>Results are shared with all members of the Department of Geology and Geography and with CASL.</p>

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
			<p>In taking GIS II and Remote Sensing II this year, [student] learned how to make maps and analyses with computers. Although very little of the mapping was tied to geology it can easily be used for geological purposes. This ties in with field camp from last summer in which map making was done by hand. Now I know both methods by hand and with computers (freshman)</p> <p>In ... biology-based class, was able to work (sometimes hand-in-hand) with related and relevant material. It wasn't all the time, but there were times when [student] understood lectures and was able to process more in depth information because of correlations (junior)</p> <p>Pretty much all of courses has been required for ... major (junior)</p> <p>Have not learned much from ... basic classes outside of [student] major, EIU really "dumbs-down" those courses to get students through (senior)</p>	

**Results from Geology Field Camp, Summer 2009**

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
<p>1. Geology graduates will develop skills to carry out scientific inquiry in the earth sciences.</p>	<p>Students were assessed throughout the semester via assignments that included constructing pace and compass maps, topographic maps, geologic maps, geologic cross sections, detailed stratigraphic sections, maps from aerial photographs, maps from GPS data, and written reports.</p>	<p>Students are expected to apply their overall classroom knowledge acquired from courses taught in the Geology program to collect geologic field data, make geologic maps and cross sections, and interpret the geologic history of the assigned areas.</p>	<p>On the last day of Geology Field Camp 2009, all 20 students (EIU and non-EIU) were given a learning assessment form in which they were requested to respond to the following:</p> <p><b><i>Reflecting back on the past 6 weeks, list 10 geological principles, concepts, techniques, skills, etc., that you have learned (or increased your understanding of) at Geology Field Camp.</i></b></p> <p>Below is a general summary of the topics that students indicated that they learned or increased their understanding of during Geology Field Camp. 100% of the students indicated an increased ability in all of the topics listed below.</p> <ol style="list-style-type: none"> <li>1. Brunton Compass skills for taking geological field measurements.</li> <li>2. General field skills (rock, mineral, formation, and geologic contact I.D.).</li> <li>3. Taking accurate field notes and data.</li> <li>4. Thinking geologically,</li> </ol>	<p>Kathy Bower, chair of the Geology Assessment Committee, is responsible for the Geology Assessment Program. Results are shared with Geology program faculty and the rest of the Department of Geology/Geography</p>

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
			<p>stratigraphically, and 3-dimensionally while in the field.</p> <p>5. Overall field ability and mapping skills: including topographic maps, topographic profiles, geologic maps, geologic cross sections, using and interpreting aerial photographs.</p> <p>6. Using Global Positioning System (GPS) equipment in the field (hand-held and carried phase).</p> <p>7. Learning special field techniques (trend &amp; plunge, bearings, section measuring, slope measuring).</p> <p>8. Mining (gold, platinum, coal).</p> <p>9. Construction of complete geologic maps and geologic cross-sections using data collected in the field.</p> <p>10. Comprehension of scale, distance, geology in 3-D, effect of topography on contacts, exposures and interpretations.</p> <p>11. Working with partners and within a larger group.</p> <p>In 2009, 35% of Geology Field Camp students were from EIU. EIU students received 25% of the A's, 38% of the B's, and 33% of</p>	

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
			<p>the C's. One could argue that if EIU students are comparable to the nationwide pool, then they should have received 35% of the A's, B's, and C's that were assigned. Based upon this comparison, it appears that the EIU students performed at a similar level to the non-EIU students.</p>	
<p>2. Geology graduates should have a thorough knowledge and understanding of core concepts in the earth sciences including the following areas:</p> <p>2.1 Major physical and historical events of the Earth, and the methods used to interpret these events;</p> <p>2.2 Common mineral, rock, and soil physical processes; the identification and classification of common minerals, rocks, and soils; and their genesis;</p> <p>2.3 Surface geologic processes and their impact on development of landforms, and the ability to identify and interpret landform development;</p> <p>2.4 Basic tectonic processes, and the ability to interpret</p>	<p>Students were assessed throughout the semester via assignments that included constructing pace and compass maps, topographic maps, geologic maps, geologic cross sections, detailed stratigraphic sections, maps from aerial photographs, maps from GPS data, and written reports.</p>	<p>Students are expected to apply their overall classroom knowledge acquired from courses taught in the Geology program to collect geologic field data, make geologic maps and cross sections, and interpret the geologic history of the assigned areas.</p>	<p>On the last day of Geology Field Camp 2009, all 20 students (EIU and non-EIU) were given a learning assessment form in which they were requested to respond to the following:</p> <p><b><i>Reflecting back on the past 6 weeks, list 10 geological principles, concepts, techniques, skills, etc., that you have learned (or increased your understanding of) at Geology Field Camp.</i></b></p> <p>Below is a general summary of the topics that students indicated that they learned or increased their understanding of during Geology Field Camp. 100% of the students indicated an increased ability in all of the topics listed below.</p>	<p>Kathy Bower, chair of the Geology Assessment Committee, is responsible for the Geology Assessment Program. Results are shared with Geology program faculty and the rest of the Department of Geology/Geography</p>

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<p>structural relations from geologic data;</p> <p>2.5 Processes occurring at different types of lithospheric plate boundaries</p> <p>2.6 Interactions between and major processes occurring within the major spheres (biosphere, hydrosphere, atmosphere, and geosphere) and cycles (e.g. geochemical) of Earth.</p>			<ol style="list-style-type: none"> <li>1. Brunton Compass skills for taking geological field measurements.</li> <li>2. General field skills (rock, mineral, formation, and geologic contact I.D.).</li> <li>3. Taking accurate field notes and data.</li> <li>4. Thinking geologically, stratigraphically, and 3-dimensionally while in the field.</li> <li>5. Overall field ability and mapping skills: including topographic maps, topographic profiles, geologic maps, geologic cross sections, using and interpreting aerial photographs.</li> <li>6. Using Global Positioning System (GPS) equipment in the field (hand-held and carried phase).</li> <li>7. Learning special field techniques (trend &amp; plunge, bearings, section measuring, slope measuring).</li> <li>8. Mining (gold, platinum, coal).</li> <li>9. Construction of complete geologic maps and geologic cross-sections using data collected in the field.</li> <li>10. Comprehension of scale, distance, geology in 3-D, effect of topography on contacts, exposures and</li> </ol>	

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			<p>interpretations. 11. Working with partners and within a larger group.</p> <p>In 2009, 35% of Geology Field Camp students were from EIU. EIU students received 25% of the A's, 38% of the B's, and 33% of the C's. One could argue that if EIU students are comparable to the nationwide pool, then they should have received 35% of the A's, B's, and C's that were assigned. Based upon this comparison, it appears that the EIU students performed at a similar level to the non-EIU students.</p>	
<p>3. Geology graduates should have a set of fundamental skills that they can apply to a variety of situations, including</p> <p>3.1. Critical thinking skills – the ability to formulate strategies, collect and synthesize data, and apply mathematical and graphical techniques to arrive at solutions, and interpret results related to geological processes;</p> <p>3.2. Development and use of models, visualizations, and three-</p>	<p>Students were assessed throughout the semester via assignments that included constructing pace and compass maps, topographic maps, geologic maps, geologic cross sections, detailed stratigraphic sections, maps from aerial photographs, maps from GPS data, and written reports.</p>	<p>Students are expected to apply their overall classroom knowledge acquired from courses taught in the Geology program to collect geologic field data, make geologic maps and cross sections, and interpret the geologic history of the assigned areas.</p>	<p>On the last day of Geology Field Camp 2009, all 20 students (EIU and non-EIU) were given a learning assessment form in which they were requested to respond to the following:</p> <p><b><i>Reflecting back on the past 6 weeks, list 10 geological principles, concepts, techniques, skills, etc., that you have learned (or increased your understanding of) at Geology Field Camp.</i></b></p> <p>Below is a general summary</p>	<p>Kathy Bower, chair of the Geology Assessment Committee, is responsible for the Geology Assessment Program. Results are shared with Geology program faculty and the rest of the Department of Geology/Geography</p>

<b>What are the learning objectives?</b>	<b>How, where, and when are they assessed?</b>	<b>What are the expectations?</b>	<b>What are the results?</b>	<b>Committee/ person responsible? How are results shared?</b>
<p>dimensional conceptualizations;</p> <p>3.3. Communication Skills – the ability to clearly express earth science concepts and present results from analysis, laboratory and field work in written, oral, and graphic format.</p> <p>3.4. Global Citizenship - the ability to function as responsible global citizens by making objective decisions informed by multiple perspectives</p>			<p>of the topics that students indicated that they learned or increased their understanding of during Geology Field Camp. 100% of the students indicated an increased ability in all of the topics listed below.</p> <ol style="list-style-type: none"> <li>1. Brunton Compass skills for taking geological field measurements.</li> <li>2. General field skills (rock, mineral, formation, and geologic contact I.D.).</li> <li>3. Taking accurate field notes and data.</li> <li>4. Thinking geologically, stratigraphically, and 3-dimensionally while in the field.</li> <li>5. Overall field ability and mapping skills: including topographic maps, topographic profiles, geologic maps, geologic cross sections, using and interpreting aerial photographs.</li> <li>6. Using Global Positioning System (GPS) equipment in the field (hand-held and carried phase).</li> <li>7. Learning special field techniques (trend &amp; plunge, bearings, section measuring, slope measuring).</li> <li>8. Mining (gold, platinum,</li> </ol>	

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
			<p>coal).</p> <p>9. Construction of complete geologic maps and geologic cross-sections using data collected in the field.</p> <p>10. Comprehension of scale, distance, geology in 3-D, effect of topography on contacts, exposures and interpretations.</p> <p>11. Working with partners and within a larger group.</p> <p>In 2009, 35% of Geology Field Camp students were from EIU. EIU students received 25% of the A's, 38% of the B's, and 33% of the C's. One could argue that if EIU students are comparable to the nationwide pool, then they should have received 35% of the A's, B's, and C's that were assigned. Based upon this comparison, it appears that the EIU students performed at a similar level to the non-EIU students.</p>	

## **PART TWO**

Describe what your program's assessment accomplishments since your last report was submitted. Discuss ways in which you have responded to the CASA Director's comments on last year's report or simply describe what assessment work was initiated, continued, or completed.

The Geology Program Assessment Sub-committee has adopted a plan to assess Geology Program student mastery over the entire program (Appendix I). The plan includes assessment of student attainment of learning objectives through student self-report of accomplishments in the geology program, analysis of student mastery in the capstone Geology Program course, and assessment of student accomplishments through exit and alumni surveys. The exit and alumni surveys are still in the development phase but nearing completion. Geology Program faculty have agreed upon outcomes and expectations for the program and continue to discuss and develop the Departmental Assessment Plan in Geology.

The Survey of Geology Majors' Mastery of learning objectives was developed and administered to students in Spring 2010. A summary of results is in Appendix II.

## **PART THREE**

Summarize changes and improvements in **curriculum, instruction, and learning** that have resulted from the implementation of your assessment program. How have you used the data? What have you learned? In light of what you have learned through your assessment efforts this year and in past years, what are your plans for the future?

The assessment process has focused the EIU geology faculty on identifying the essential components of student learning within the program. These components are being compared with those geology learning objectives identified by other institutions which are currently going through similar assessment processes. This has improved the curriculum by challenging faculty to compare current curricular material with identified learning objectives. The Geology Program faculty continue to use the results of assessment of student learning to improve the curriculum.

It should be noted that EIU is not the only undergraduate educational institute identifying learning objectives for geology and assessing attainment of them. However, currently there are no national or professional standards for educational learning objectives in undergraduate geology programs. This lack is being discussed within geologic professional organizations and standards of learning objectives may be developed in the future.

## **Appendix I:**

### **Eastern Illinois University Department of Geology/Geography**

#### **Geology Program Student Learning Assessment Plan**

Approved by Geology Faculty: 2/2/10

Approved by Department of Geology/Geography Faculty: 3/31/10

### **Introduction**

The Departmental Assessment Geology Plan serves as an overall measure of the effectiveness of the curriculum providing students with a well-rounded background in geologic knowledge, analytic skills, and presentation skills. The Geology Program curriculum committee has developed a sequence of required and elective courses that presents students with a broad background of geologic knowledge and technical skills. These will serve as a strong foundation for further education or a career as a professional geologist.

### **Mission Statement**

The mission of the Geology Program within the Department of Geology/Geography is to provide quality undergraduate education in the earth sciences to students of Eastern Illinois University. We seek to provide an enriched learning environment for students through extensive interaction between faculty and students, emphasis on scholarship, field experiences and use of technology-enhanced instruction. The department offers programs that will enhance critical thinking, global citizenship, and communication skills in our majors and minors. The department offers programs that provide students with the essential knowledge and skills needed to qualify them for additional graduate education or professional employment, including licensing, in the earth sciences or related fields. The department also contributes to the broader mission of the University by providing general education courses that enhance student awareness, appreciation, and understanding of the physical environment and the scientific process. In order to promote faculty vitality and increase scientific knowledge, the department encourages faculty to engage in basic and applied research. The department actively encourages and supports undergraduate inquiry through independent or one-on-one research with faculty members. We offer international educational experiences to students to enhance global skills needed by professionals working in a global community. Geology faculty also interact in a professional capacity with the community and public school system through education and outreach programs. We seek to continue building a solid base of personnel and facilities to serve Eastern Illinois University and central Illinois.

### **Goals and Objectives of Geology Student Learning**

The Department of Geology and Geography expects each geology major or minor to acquire a set of comprehensive geologic principles and expertise including the ability to skillfully present information in written and oral forms. In addition, graduates of geology are expected to carry out independent research on a geologic topic. The department requires geology majors and minors to successfully complete a series of courses throughout their undergraduate program in order to acquire this

knowledge and skill base. Geology major graduate will have accomplished the following goals as a result of their courses and other activities within the department.

1. **Goal:** Geology graduates will develop skills to carry out scientific inquiry in the earth sciences.
2. **Goal:** Geology graduates should have a thorough knowledge and understanding of core concepts in the earth sciences including the following areas:
  - 2.1 Major physical and historical events of the Earth, and the methods used to interpret these events;
  - 2.2 Common mineral, rock, and soil physical processes; the identification and classification of common minerals, rocks, and soils; and their genesis;
  - 2.3 Surface geologic processes and their impact on development of landforms, and the ability to identify and interpret landform development;
  - 2.4 Basic tectonic processes, and the ability to interpret structural relations from geologic data;
  - 2.5 Processes occurring at different types of lithospheric plate boundaries
  - 2.6 Interactions between and major processes occurring within the major spheres (biosphere, hydrosphere, atmosphere, and geosphere) and cycles (e.g. geochemical) of Earth.
3. **Goal:** Geology graduates should have a set of fundamental skills that they can apply to a variety of situations, including
  - 3.1. Critical thinking skills – the ability to formulate strategies, collect and synthesize data, and apply mathematical and graphical techniques to arrive at solutions, and interpret results related to geological processes;
  - 3.2. Development and use of models, visualizations, and three-dimensional conceptualizations;
  - 3.3. Communication Skills – the ability to clearly express earth science concepts and present results from analysis, laboratory and field work in written, oral, and graphic format.
  - 3.4. Global Citizenship - the ability to function as responsible global citizens by making objective decisions informed by multiple perspectives

The goals are related to courses in the geology program as shown in Table 1.

**Table 1: Learning objectives taught in Geology courses required of Geology majors**

Learning Objectives	Gel 1300G Earth Sciences	Gel 1430 Historical Geology	Gel 2440 Mineralogy	Gel 3405 Petrology	Gel 3420 Principles of Geomorphology	Gel 3430 Structural Geology	Gel 3510 Principles of Sedimentation	Gel 3560 Principles of Stratigraphy	Gel 4335 Environmental Geology	Gel 4490 Invertebrate Paleontology	Gel 4800 Summer Field Geology	Assessment Method
1. Scientific Inquiry	I	P	P	P	P	P	P	P	P	P	D	Student self-report/ Field Camp Assessment
2.1 Major physical and historical events	I	P						P		P	P	Student self-report/ Field Camp Assessment
2.2 Mineral, rock, and soil physical processes	I		P	P	P	P	P		P	P	D	Student self-report/ Field Camp Assessment

Learning Objectives	Gel 1300G Earth Sciences	Gel 1430 Historical Geology	Gel 2440 Mineralogy	Gel 3405 Petrology	Gel 3420 Principles of Geomorphology	Gel 3430 Structural Geology	Gel 3510 Principles of Sedimentation	Gel 3560 Principles of Stratigraphy	Gel 4335 Environmental Geology	Gel 4490 Invertebrate Paleontology	Gel 4800 Summer Field Geology	Assessment Method
2.3. Surface geologic processes	I	P			P	P	P	P		P	D	Student self-report/ Field Camp Assessment
2.4. Basic tectonics	I	P			P	P		P			P	Student self-report/ Field Camp Assessment
2.5 Lithospheric plate boundaries	I	P		P		P						Student self-report/ Field Camp Assessment
2.6. Major geological cycles	I	P	P	P	P	P	P	P	D	P	P	Student self-report/ Field Camp Assessment
3.1. Critical thinking skills	I	P	P	P	P	P	P	P	P	P	D	Student self-report/ Field Camp Assessment/ Watson-Glaser Results
3.2 Visualization skills	I	P	P	P	P	P	P	P	P	P	D	Student self-report/ Field Camp Assessment
3.3 Communication Skills	I	P	P	P	P	P	P	D	P	P	P	Student self-report/ Field Camp Assessment/ EWP Results
3.4 Global Citizenship	I	P	P	P	P	P	P	P	P	P	P	Student self-report/ Field Camp Assessment

I = Introduced, P = Progress, D = Opportunities for students to demonstrate mastery

## Methods of Assessment

The assessment of the above Student Learning Goals and Objectives are measured at multiple stages in each student's program. They are measured by both direct and indirect methods. The assessment includes the following:

- Assessment of educational outcomes of Geology majors and minors will be performed before the tenth week of each spring semester. Every student who is a Geology program major will be required to submit their answers anonymously to four assessment questions to the department before they may register for Fall or Summer classes:
  - Based only on the average course level of the courses you took this year in the department (GEL prefix), what level are you? (1000, 2000, 3000, 4000)?
  - List at least 5 of the most important things or skills you learned or continued to develop this academic year as a geology major.
  - What connections did you make this year between and among the subjects of the courses required for your geology major?
  - What connections did you make this year between and among the subjects of all your courses taken at EIU?

These answers will be summarized by class level.
- All EIU geology program majors must successfully complete a geology capstone course, Geology Field Camp. Historically, 24% of the students in the course come from EIU and 76% come from other geology programs across the U.S. Such a diverse population allows comparison of the geologic knowledge and skills of EIU geology majors with majors from other geology undergraduate programs. Thus, comparing the percentage of EIU students earning a

particular grade with students from other geology programs across the U.S. in the EIU Geology Field Camp is an indication of how well EIU geology program students are prepared. This information from each summer term will be used to track the preparedness of EIU students in geologic knowledge and skills.

3. An exit survey of geology majors and minors will be conducted to determine the level of satisfaction students have with the undergraduate experience in the Geology Program. Categories of questions include satisfaction with the undergraduate curriculum and any research or internship experience in which the student may have participated.
4. An alumni survey will be mailed to all geology graduates, 1 year, 3 years, and 10 years after graduation. This will allow time for the student to work on careers, interact with peers, determine if the EIU experience provided him/her with a useful background in geology and help the department to further assess potential improvements in the program.

### **Who Will Perform the Assessment**

The Departmental Assessment Geology Subcommittee is composed of the entire Geology Program tenure/tenure track faculty. A chair is appointed to ensure that activities are conducted in a timely manner. The chair maintains the current and historic assessment records on the department server.

### **Timing of Assessment Activities**

Summary of students' response to the four assessment questions will be performed by the Departmental Assessment Geology Subcommittee Chair. The Geology Field Camp Director will assess student geologic skills, critical thinking, and knowledge of geology during the Geology Field Camp. Exit surveys of student satisfaction with the geology program will be given to graduating seniors by the Departmental Assessment Geology Subcommittee Chair in the 10<sup>th</sup> week of the last semester of residence. Evaluation summaries of the four student questions, exit surveys, and the Field Camp assessment are to be delivered in electronic format to the Departmental Assessment Geology Subcommittee Chair within three days after final exam week of each semester. The Alumni Survey will be sent to each graduating geology major or minor 1 year, 3 years, and 10 years after graduation. The summary of the results will be delivered in electronic format to the Departmental Assessment Geology Subcommittee Chair by the end of the following semester.

### **Form of Assessment Data Summary**

Data describing student learning will be compiled, analyzed, summarized and reported on the annual EIU Student Learning Assessment Program summary form. The results of each type of assessment tool will be averaged each year. The results over time will be compiled.

### **Evaluation of Data for Program Improvement of Curriculum Revision**

The Departmental Assessment Geology Subcommittee will meet as a group after the end of each academic year to evaluate student learning performance in relation to the Geology's learning goals and objectives. The committee, by quantitative and qualitative methods, will identify significant strength and weaknesses in the curriculum. Attention will be given to national trends within the discipline and employment and graduate school requirements. Individual courses and/or program curriculum and/or the goals and objective may be modified to meet the needs of the changing trends of the geology career.

## Appendix II:

### Geology Program Assessment, Summary of Survey Results Spring 2010

K. Bower

7 students responded – 2 freshmen, no sophomores, two juniors, and 3 seniors

#### List at least 5 of the most important things or skills you learned or continued to develop this academic year as a geology major.

Freshman:

- 1) Use of backpack GPS system through department internship
- 

Junior:

- 2) Knowledge in each field of class, sometimes with skills to use knowledge
  - 3) Leadership skills
  - 4) Interpretation of teacher expectations and ability to learn information in courses better. There was usually an underlying theme or system and information was co-related.
  - 5) Increased confidence in geology research, oral communication, writing ability and interest in similar fields
- 

Senior:

- 1) Stratigraphic interpretation, Petrographic microscope identification, Thin section preparation, Basics of GIS, Sequence stratigraphy
- 2) Optical Mineralogy including interference figures, becke lines, + and - elongation, the study of the Lunar rocks from NASA, and how to make thin sections properly.
- 3) Correlation of strata, real world applications for coal and oil exploration such as wirelines and how to ready logs that come in

#### What connections did you make this year between and among the subjects of the courses required for your geology major?

Freshman:

- 1) All geology classes are related one way or another.
- 

Junior:

- 2) A high level of horizontal and vertical integration of learning. There were old subjects I expanded upon, new subjects to learn, and other classes that I could use in order to further learn and accomplish my academic obligations.
  - 3) Relation of formation of petrological bodies with aspects of historical geology, geomorphology relating to petrology of weathering outcrops
- 

Senior:

- 4) Use of petrographic microscope to observe crystal properties has really tied together my experiences in mineralogy and petrology.

- 5) Need stronger background in environmental geology, considering it's the 2nd largest field for geologists to go into.

**What connections did you make this year between and among the subjects of all your courses taken at EIU?**

**Freshman:**

- 1) In taking GIS II and Remote Sensing II this year, learned how to make maps and analyses with computers. Although very little of the mapping was tied to geology it can easily be used for geological purposes. This ties in with field camp from last summer in which map making was done by hand. Now I know both methods by hand and with computers.
- 

**Junior:**

- 2) In my biology-based class, was able to work (sometimes hand-in-hand) with related and relevant material. It wasn't all the time, but there were times when I understood lectures and was able to process more in depth information because of correlations.
  - 3) pretty much all of my courses has been required for my major
- 

**Seniors:**

- 4) Have not learned much from my basic classes outside of my major, EIU really "dumbs-down" those courses to get students through.
- 5) Worried about future sustainability of Geology Program due to departmental faculty personality conflicts

**Comments unrelated to questions on survey:**

**Junior:**

- 1) Sometimes assignments felt like busywork
- 

**Seniors:**

- 2) Student appreciated teaching ability of one or more faculty
- 3) Student did not appreciate teaching ability of one or more faculty
- 4) Worried about future sustainability of Geology Program due to departmental faculty personality conflicts