

Environmental Studies Program Learning Outcomes Assessment

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Instructor(s): Bridenbecker, Delaney, Dorner, Parkin, Williams

Environmental Studies Program Student Learning Outcomes (PLO)

Upon successful completion of this program students will be able to:

1. Compare and contrast best practices in environmental studies including ethical behavior and peer-reviewed research.
(Institutional SLOs: Ethics, Personal Development, and Information Competency)
2. Utilize scientific methods to empirically test hypotheses and apply findings within the context of the sciences.
(Institutional SLOs: Communication, Critical Thinking, Personal Development, and Information Competency)
3. Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.
(Institutional SLOs: Communication, Critical Thinking, Personal Development, and Information Competency)

Environmental Studies Program SLO3 (PLO 3) and associated Institutional SLO (ILO 1, 2, 4 and 5) were assessed in Fall 2012, Spring 2013 and Summer 2013 by comparison of linked course-level SLO from among the required or restricted elective science courses for the Associate of Science Degree in Environmental Studies. These included sections of Biology (BI-001A, BI-004, BI-004L), Chemistry (CH-003), Geology (G-001, G-010), Geography (GEOG-001), and Natural Resources (NR-001), listed alphabetically in the table below. This comparison method provides information on a discontinuous group of students, so there is no assurance that the same students are being assessed for each SLO in across the different courses. Science faculty dialogued about the results at Flex Day and Science discipline meetings. Common themes from SLO assessment were identified. Strategies to mitigate them were proposed and detailed in the Improvement Plan column of this document. The average assessment result for PLO3 was 85.35% for this time period.

Environmental Studies PLO3	Associated ILO	Assessment Methodology	Results of Assessment	Improvement Plan
<p>BI 001A, Fall 2012 Principles of General Biology- Cellular and Molecular Dorner</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills</p> <p>Critical Thinking Skills</p> <p>Ethics</p> <p>Personal Development</p> <p>Information Competency</p>	<p>Comparison of courses required for Environmental Science degree</p> <p>This lab report will be written in the form of a scientific paper like those seen in a scientific journal. The format of a scientific paper is different than other papers you have written in English class or other writing courses. A scientific paper follows the general form of the scientific method of forming a hypothesis, testing the hypothesis by an experiment, then interpreting the results to see if they do or do not support the hypothesis. The purpose of a scientific paper is to communicate to others the results of an experiment and what the data mean according to the author's interpretation. (Note that "data" is plural and requires a plural verb in a sentence. A single bit of information is a "datum," which is rarely used.)</p> <p>Title (5 points)</p> <ul style="list-style-type: none"> • Factor(s) manipulated in experiment • Specific aspect of subject that was focus of experiment • Specific name of subject involved in experiment <p>Materials and Methods (15 points)</p> <ul style="list-style-type: none"> • Detailed and complete description of experimental setup and all materials • Thorough description of procedures • Presentation of the above in 	<p>Listed as percent of students answering the assessment question/s correctly. If multiple questions were assessed, results are listed as un-weighted mathematical averages. If test and re-test methods were used, re-test average (percent) was used to calculate the result.</p> <p>N = 15</p> <p>15/15 (100%) students received at least 52 out of 75 points (70%). Students did meet the expectations of the SLO.</p>	<p>Based on the assessment results are there any modifications to the program that you intend to implement?</p> <p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: continue providing opportunities to write lab reports and receive feedback.</p>

		<p>narrative form (no lists)</p> <p>Results (15 points)</p> <ul style="list-style-type: none"> • Data table positioned within text of lab report • Reference to data table in text of lab report • Correct labeling of table • Description of significant results in table/figures within text • Absence of conclusions <p>Discussion (25 points)</p> <ul style="list-style-type: none"> • Presentation of a definite, clear conclusion • Explanation of why the experiment supports or does not support the hypothesis <p>Literature Cited (5 points)</p> <ul style="list-style-type: none"> • Appearance of citation sources in both text of lab report and this section • Correct alphabetical listing of sources <p>Correct format</p>																							
<p>BI 004-01, Fall 2012 Elements of Biology Dorner</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills</p> <p>Critical Thinking Skills</p> <p>Personal Development</p> <p>Information Competency</p>	<p>Students were given the following questions on an exam:</p> <p>1) Ecology is the study of____.</p> <p>A) interactions between organisms and their environments</p> <p>B) life</p> <p>C) relationships among different species</p> <p>D) interactions between humans and other species</p> <p>E) human effects on the environment</p> <p>2) In an aquatic ecosystem, what name is given to the region where photosynthesis can occur?</p> <p>A) aphotic zone</p> <p>B) pelagic zone</p> <p>C) thermocline</p> <p>D) benthic zone</p> <p>E) photic zone</p> <p>3) What level of ecology is concerned with groups of individuals of the same species?</p> <p>A) organism</p> <p>B) ecosystem</p> <p>C) population</p> <p>D) tissue</p> <p>E) community</p> <p>4) Which of these convert organic matter to inorganic matter by breaking down dead</p>	<p>87%, N = 15</p> <table border="1"> <thead> <tr> <th>Question</th> <th>students correct</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>15</td> <td>100</td> </tr> <tr> <td>2</td> <td>14</td> <td>93.33</td> </tr> <tr> <td>3</td> <td>12</td> <td>80</td> </tr> <tr> <td>4</td> <td>14</td> <td>93.33</td> </tr> <tr> <td>5</td> <td>11</td> <td>73.33</td> </tr> <tr> <td>6</td> <td>12</td> <td>80</td> </tr> </tbody> </table>	Question	students correct	%	1	15	100	2	14	93.33	3	12	80	4	14	93.33	5	11	73.33	6	12	80	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: Students did meet the expectations of the SLO. In the future, spend more time on the concept of biological organization. Focus on habitats and their characteristics.</p>
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		<p>organisms?</p> <p>A) decomposers B) primary consumers C) detritivores D) producers E) secondary consumers</p> <p>5) Organisms at the first trophic level are _____.</p> <p>A) producers B) decomposers C) primary consumers D) predators E) detritivores</p> <p>6) What are estuaries?</p> <p>A) a freshwater biome B) regions where ocean water meets land C) regions where two rivers join D) regions where fresh water and salt water mix E) the start of a river</p>		
<p>BI 004-02, Fall 2012 Elements of Biology Delaney</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills Critical Thinking Skills Personal Development Information Competency</p>	<p>SLO2: Chapter 3 Quiz Question 21 As a result of studying lactose intolerance in people from different geographic regions, scientists were able to determine that _____. Hint: Think about this question from an evolutionary perspective.</p> <p>a. natural selection could favor anyone with a mutation for a permanently active lactase gene b. there is only one possible mutation that will affect lactose intolerance c. there is no evolutionary significance to their study d. nucleotide sequences in the lactase gene are radically different in lactose-tolerant and lactose-intolerant individuals e. mutations have nothing to do with evolution.</p> <p>SLO2: Chapter 4 Quiz Question 11 A study conducted by the National Institutes of Health on infectivity of methicillin resistant <i>Staphylococcus aureus</i> (MRSA) stated their hypothesis as _____. Hint: Review the definition of hypothesis.</p> <p>a. mice infected with bacteria lacking the ability to produce a protein (PSM) did not die. b. asking if a protein (PSM) plays a role in MRSA infection c. MRSA bacteria lacking ability to produce a protein (PSM) would be less deadly than those producing it</p>	<p>Fall 2012: 91.67%</p> <p>CMC students improved relative to System student pool.</p> <p>Chapter 3, Question 21: CMC 80% , n =25 System 76%, n =550.</p> <p>Chapter 4, Question 11: CMC 100%, n =24 System 89%, n=706.</p> <p>Chapter 20, Question 11: CMC 95% , n = 20 System 97% (n=845).</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: Focus instruction on selection of human genes. Focus instruction on the scientific method and definition of hypothesis.</p>

		<p>d. all bacteria causing disease do so using the same pathogenic mechanism</p> <p>e. a protein (PSM) disables human immune cells.</p> <p>SLO2: Chapter 20, Quiz Question 11: Why do toxins accumulate at such high levels in carnivores? Hint: Review energy pyramids and biological magnification.</p> <p>a. Most toxins, if consumed by herbivores, are excreted and so do not accumulate.</p> <p>b. Because they are at the top of the energy pyramid, they eat more food and so accumulate the most toxins.</p> <p>c. Toxins accumulate only in the tissues of carnivores because they are meat eaters.</p> <p>d. Very few toxins are found in plants, so herbivores are less likely to accumulate toxins.</p> <p>e. Biomass at any given trophic level is accumulated from a much larger toxin-containing biomass ingested from the level below.</p>		
<p>BI 004-03, Fall 2012 Elements of Biology S. Ritter</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills</p> <p>Critical Thinking Skills</p> <p>Personal Development</p> <p>Information Competency</p>	<p>Multiple Choice Questions</p> <p>15. Which of the following is a good example of evolution occurring in our time?</p> <p>a. The presence of long generation times in organisms</p> <p>b. The genetic differences among different human groups</p> <p>c. The process of crossing over in meiosis</p> <p>d. The development of pesticide-resistant insects</p> <p>e. The occurrence of many different breeds of dogs</p> <p>17. Four of the five answers listed below are characteristic of mutations. Select the exception.</p> <p>a. predictable</p> <p>b. lethal, beneficial or neutral</p> <p>c. random</p> <p>d. effects depend upon environment</p> <p>e. heritable</p> <p>19. How do new alleles arise in a population?</p> <p>a. sexual reproduction</p> <p>b. mutations of pre-existing alleles</p> <p>c. meiosis</p> <p>d. protein synthesis</p>	<p>81.33%</p> <p>Question 15: Correct answer: 72 % n=21</p> <p>Question 17: Correct answer: 89 % n=21</p> <p>Question 19: Correct answer; 83% n=21</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: the outcome of this SLO assessment for the Fall 2012 semester is actually looking a lot better than it did for the Spring Semester, even so over all the students didn't do as well. Two students received a failing grade and only five received an A as a final grade.</p> <p>Over all this class was very odd as they were not willing or interested in having study groups and they were not using the assistance I offered for the term papers or study aids.</p> <p>Looking though their exams is obvious that they did a lot better on the multiple choice part of the exam than the essay questions, even so in class I do not give</p>

		e. the fusion of egg and sperm cells		<p>them multiple choice questions.</p> <p>I assume they student with flash cards rather than really understanding the concepts.</p> <p>Altogether I think even so they did well on these particular questions over all they didn't learn as much as my spring class.</p> <p>Class dynamics are sometimes really weird.</p>
<p>BI 004-01, Spring 2013 Elements of Biology Dorner</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills</p> <p>Critical Thinking Skills</p> <p>Personal Development</p> <p>Information Competency</p>	<p>Answer the following question on an Exam:</p> <p>Describe the process of Natural Selection. Give an example of how we see this work in nature</p>	<p>77.4 % (n= 31)</p> <p>Students performed well. They met the requirements of the SLO.</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed. Consider adding in a specific assignment on natural selection and/or showing a video clip of natural selection in process.</p>
<p>BI 004-02, Spring 2013 Elements of Biology Delaney</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills</p> <p>Critical Thinking Skills</p> <p>Personal Development</p> <p>Information Competency</p>	<p>1) Which of the following is a good example of evolution occurring in our time?</p> <p>a. The presence of long generation times in organisms</p> <p>b. The genetic differences among different human groups</p> <p>c. The process of crossing over in meiosis</p> <p>d. The development of pesticide-resistant insects</p> <p>e. The occurrence of many different breeds of dogs</p> <p>2) A process in which organisms with certain inherited characteristics are more likely to survive and reproduce than individuals with other characteristics is best termed:</p> <p>a. Descent with modification</p> <p>b. Homology</p> <p>c. Natural selection</p> <p>d. Evolutionary adaptation</p> <p>e. Evolution</p>	<p>89%</p> <p><u>Spring 2013 Results</u></p> <p>Question 1: CMC 91% , n=22 System = 91%, n=749</p> <p>Question 2: CMC 86%, n = 22 System 99%, n=6208</p> <p>Question 3: CMC 90%, n = 20 System 94%, n=2688</p> <p><u>Fall 2011 Results</u></p> <p>Question 1: CMC 91.7%, n=24, System 91.1%, n=2192.</p> <p>Question 2:</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: re-test. Focus instruction on biological species concept.</p>

		<p>3) Two animals are considered members of different species if they _____.</p> <p>a. Live in different habitats</p> <p>b. Look different</p> <p>c. Are members of different populations</p> <p>d. Cannot interbreed</p> <p>e. All of the above</p>	<p>CMC 95.8% ,n=24, System 98.4%, n=9281.</p> <p>Question 3: CMC 88% , n=25, System 96.3%, n=5186.</p>	
<p>BI 004-01, Summer 2013 Elements of Biology Delaney</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills</p> <p>Critical Thinking Skills</p> <p>Personal Development</p> <p>Information Competency</p>	<p>1) Which of the following is a good example of evolution occurring in our time?</p> <p>a. The presence of long generation times in organisms</p> <p>b. The genetic differences among different human groups</p> <p>c. The process of crossing over in meiosis</p> <p>d. The development of pesticide-resistant insects</p> <p>e. The occurrence of many different breeds of dogs</p> <p>2) A process in which organisms with certain inherited characteristics are more likely to survive and reproduce than individuals with other characteristics is best termed:</p> <p>a. Descent with modification</p> <p>b. Homology</p> <p>c. Natural selection</p> <p>d. Evolutionary adaptation</p> <p>e. Evolution</p> <p>3) Two animals are considered members of different species if they _____.</p> <p>a. Live in different habitats</p> <p>b. Look different</p> <p>c. Are members of different populations</p> <p>d. Cannot interbreed</p> <p>e. All of the above</p>	<p>91%</p> <p><u>Summer 2013 Results</u></p> <p>Question 1: CMC 84% , n=25 System 89% , n=804</p> <p>Question 2: CMC 96% , n=25 System 99% , n=6668</p> <p>Question 3: CMC 92% , n= 25 System 97% , n=2913</p> <p><u>Spring 2013 Results</u></p> <p>Question 1: CMC 91% , n=22 System 91% , n=749</p> <p>Question 2: CMC 86% , n= 22 System 99% , n=6208</p> <p>Question 3: CMC 90% , n= 20 System 94% , n=2688</p> <p><u>Fall 2011 Results</u></p> <p>Question 1: CMC 91.7% , n=24, System 91.1% , n=2192.</p> <p>Question 2: CMC 95.8% ,n=24, System 98.4%, n=9281.</p> <p>Question 3: CMC 88% , n=25, System 96.3%, n=5186.</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: re-focusing instruction on the natural selection concept was successful at raising Question 2 scores from Spring to Summer 2013. Next re-focus on Question 1, examples of evolution occurring in our time.</p>

<p>BI 004L -0, Fall 2012 Elements of Biology Laboratory Dorner</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills Critical Thinking Skills Personal Development Information Competency</p>	<p>Students are given a picture of a DNA forensic gel and asked the following questions:</p> <ol style="list-style-type: none"> 1. Which bands on the gel represent the smallest pieces of DNA? 2. Which suspect's DNA matches the crime scene? 3. What is it that causes the DNA to move through the gel? 	<p>N = 12</p> <p>11/12 (91.6%) students received at least 2 out of 3 points.</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: focus instruction on significance of short tandem repeats (STR) in DNA</p>
<p>BI 004L -02, Fall 2012 Elements of Biology Laboratory Delaney</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills Critical Thinking Skills Personal Development Information Competency</p>	<p>SLO2: Population Biology Modeling Lab Quiz 2.5 Increasing Predator Efficiency</p> <ol style="list-style-type: none"> 1. When the predation rate is 0.0030, what is the maximum population size attainable by the prey population? a. around 125 b. around 250 c. around 600 d. around 900 2. When you increased the predation rate (from 0.0030 to 0.0070), did the maximum size of prey population increase or decrease? a. It increased. b. It decreased. c. It didn't change. 3. When you increased the predation rate (from 0.0030 to 0.0070), did the maximum size of predator population increase or decrease? a. It increased. b. It decreased. c. It didn't change. 4. When you increased the predation rate, did the prey isocline go up or down, i.e. did the number of predators required to maintain the prey population at zero growth increase or decrease? a. It went down. b. It went up. c. It didn't change. 5. Does increasing the predation rate increase or decrease the variation in the size of the prey population? a. increase b. decrease c. no difference 	<p>Fall 2012 Average 89%, n = 18</p> <p>Fall 2011 Average 76%, n = 22</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: students were allowed more practice with population modeling software before assignment submission, which improved outcome.</p>
<p>BI 004L -1, Spring 2013 Elements of Biology Laboratory Dorner</p> <p>PLO3- Collaboratively</p>	<p>Communication Skills Critical Thinking Skills Personal Development</p>	<p>Dissect the shark according to the directions you have received. Use the diagram you have been provided with the label the parts of the shark as you perform your dissection</p>	<p>70%, n=27</p> <p>Students performed well. They met the requirements of the SLO. Note: the 8 students who didn't fulfill the requirements of the SLO were all absent</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do</p>

analyze collected data using problem-based learning and communicate findings in written and oral forms.	Information Competency			not transfer or enter the workforce with skill deficiencies. The Environmental Studies program was updated to facilitate student transfer success based on program review. Course modification proposed: no modification is necessary. Consider adding in a virtual dissection first to provide students with an introduction to the shark.
BI 004L -02, Spring 2013 Elements of Biology Laboratory Delaney PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.	Communication Skills Critical Thinking Skills Personal Development Information Competency	SLO3: Microscopy Focus Exercise 1. Which of the following characteristics refers to the microscope's ability to show two separate entities as separate and distinct? A. resolving power. B. magnification. C. refraction. D. polarization. E. illumination. 2. The primary purpose of staining cells on a microscope slide is to A. kill them. B. secure them to the slide. C. enlarge the cells. D. add contrast in order to see them better. E. see motility. 3. If a microbiologist is studying a specimen at a total magnification of 950X, what is the magnifying power of the objective lens if the ocular lens is 10X? A. 100X B. 950X C. 85X D. 850X E. 95X	75% <u>Spring 2013 Results</u> Average = 75%, n= 17 <u>Fall 2011 Results</u> Average = 72%, n=22	A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships. Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies. The Environmental Studies program was updated to facilitate student transfer success based on program review. Course modification proposed: retain methodology and retest.
CH 03-02, Fall 2012 Introductory General Chemistry Mitchell PLO3- Collaboratively analyze collected data using problem-based learning and	Communication Skills Critical Thinking Skills Personal Development Information Competency	Entrance/Exit Exam: 6 question multiple choice 1. A car gets 25.6 miles per gallon of gasoline. A full tank of gasoline contains 56.8 liters. How many miles can this car travel on a full tank of gasoline? (1.00 liters = 1.057 quarts). A. 1454 miles, B. 96.9	Entrance: Out of 26 students the following number answered each question correctly (percent correctly), average = 30.83%. 1. 17 (65%) 2. 7 (27%)	A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships. Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.

<p>communicate findings in written and oral forms.</p>		<p>miles, C. 1.71 miles, D. 384 miles</p> <p>2. A 48.0 gram piece of metal is dropped into 50.0 ml of water in a graduated cylinder. The water level rises to 62.4 ml. What is the density of the metal? A. 12.4 ml, B. 0.258 ml/g, C. 3.87 g/ml, D. 595 g/ml</p> <p>3. The temperature of 40.0°F is equal to which Celsius temperature? A. 4.44, B. 20.0, C. 45.0, D. 115</p> <p>4. A 400.0 g sample of water is at 30.0°C. How many joules of energy are required to raise the temperature of the water to 45.0°C? (specific heat of water = 4.184 J/g°C) A. 628 J, B. 1880 J, C. 25100 J, D. 450 J</p> <p>5. A substance has 15 protons, 16 neutrons, and 15 electrons. Which isotope is it? A. P30 or 30 P, B. P31 or 31P, C. S30 or 30S, D. S31 or 31S</p> <p>6. In the oxidation of 50.0 g of CH₄, CH₄ + 2 O₂ → CO₂ + 2 H₂O, how many moles of oxygen are used? A. 6.26, B. 0.313, C. 3.13, D. 0.626</p>	<p>3. 10 (39%)</p> <p>4. 2 (8%)</p> <p>5. 7 (27%)</p> <p>6. 5 (19%)</p> <p>Exit: Out of 20 students the following number answered each correctly (percent correctly), average = 62.5%</p> <p>1. 13 (65%)</p> <p>2. 14 (70%)</p> <p>3. 16 (80%)</p> <p>4. 9 (45%)</p> <p>5. 15 (75%)</p> <p>6. 8 (40%)</p>	<p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: students did improve from the entrance exam to the exit exam, but not to the degree that was expected. Particularly on questions 4 and 6 the improvement was not up to the desired amount. These were both math type questions, which throughout the semester were a struggling point for my students.</p> <p>Extra emphasis will be placed next semester on teaching students how to stay organized and to record all steps of their reasoning process when solving problems. This will help on evaluations since many of the students missed questions on math errors and not actual chemistry knowledge. Additionally, I plan on implementing additional worksheets and possible quizzes to ensure students are studying throughout the semester and not simply before exams to combat the issue of students falling behind on material.</p>
<p>CH 03-03, Fall 2012 Introductory General Chemistry Mitchell</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills</p> <p>Critical Thinking Skills</p> <p>Personal Development</p> <p>Information Competency</p>	<p>Entrance/Exit Exam: 6 question multiple choice</p> <p>1. A car gets 25.6 miles per gallon of gasoline. A full tank of gasoline contains 56.8 liters. How many miles can this car travel on a full tank of gasoline? (1.00 liters = 1.057 quarts). A. 1454 miles, B. 96.9 miles, C. 1.71 miles, D. 384 miles</p> <p>2. A 48.0 gram piece of metal is dropped into 50.0 ml of water in a graduated cylinder. The water level rises to 62.4 ml. What is the density of the metal? A. 12.4 ml, B. 0.258 ml/g, C. 3.87 g/ml, D. 595 g/ml</p> <p>3. The temperature of 40.0°F is equal to which Celsius temperature? A. 4.44, B. 20.0, C. 45.0, D. 115</p> <p>4. A 400.0 g sample of water is at 30.0°C. How many joules of energy are required to raise the temperature of the water to 45.0°C? (specific heat of water = 4.184 J/g°C) A. 628</p>	<p>Entrance: Out of 16 students the following number answered each question correctly (percent correctly), average = 42.83%</p> <p>1. 8 (50%)</p> <p>2. 7 (44%)</p> <p>3. 16 (100%)</p> <p>4. 4 (25%)</p> <p>5. 3 (19%)</p> <p>6. 3 (19%)</p> <p>Exit: Out of 15 students the following number answered each correctly (percent correctly), average = 68.83%</p> <p>1. 13 (87%)</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: students did improve from the entrance exam to the exit exam, and improvement was better than my CH 3-02 section. Question 6 still remains a difficult style of question for the students and will need to be focused on in the future. 4 students scored perfect scores and 5 students only missed one question.</p> <p>Extra emphasis will be placed next semester on teaching students how to stay organized and to record all steps of their reasoning process when solving</p>

		<p>J, B. 1880 J, C. 25100 J, D. 450 J</p> <p>5. A substance has 15 protons, 16 neutrons, and 15 electrons. Which isotope is it? A. P30 or 30 P, B. P31 or 31P, C. S30 or 30S, D. S31 or 31S</p> <p>6. In the oxidation of 50.0 g of CH₄, CH₄ + 2 O₂ → CO₂ + 2 H₂O, how many moles of oxygen are used? A. 6.26, B. 0.313, C. 3.13, D. 0.626</p>	<p>2. 8 (53%)</p> <p>3. 12 (80%)</p> <p>4. 10 (67%)</p> <p>5. 14 (93%)</p> <p>6. 5 (33%)</p>	<p>problems. This will help on evaluations since many of the students missed questions on math errors and not actual chemistry knowledge. Additionally, I plan on implementing additional worksheets and possible quizzes to ensure students are studying throughout the semester and not simply before exams to combat the issue of students falling behind on material</p>
<p>G-001, Fall 2012 Physical Geology Bridenbecker</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills</p> <p>Critical Thinking Skills</p> <p>Personal Development</p> <p>Information Competency</p>	<p>The final assessment was a questionnaire listing the SLO and students were asked to if they felt it was adequately covered during the semester. The information on the structure of the Earth and the processes responsible for forming them were assessed by quizzes and the lab workbook. The identification of rocks and minerals were assessed by lab workbook, quizzes, and lab practicum exams were students were tested over 15 rocks and 15 minerals. During the rock and mineral practicum's students were each given a cup of rocks/minerals and were allowed to use the lab manual to help identify them. Questions on the structure of the Earth and processes for forming rocks were found on quizzes as various topics were covered.</p>	<p>17 students took the SLO Assessment worth 25 points. The high score was 25 and the low score was 12 with an average of 94%. All of the students felt the material was adequately covered.</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: students did well with the rock and mineral quizzes and the lab manual questions. Future course modifications will include identifying fewer rocks and minerals as students spent more time on it than necessary cutting into other areas of importance.</p>
<p>G-010, Spring 2013 Earth Science Bridenbecker</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills</p> <p>Critical Thinking Skills</p> <p>Personal Development</p> <p>Information Competency</p>	<p>Theories relating to the origin and evolution of life, volcanoes, mountain belts, soil, glaciers, streams, lakes, and oceans were assessed by quizzes, field trips, and a lab workbook. Field trips required reports, which included what was learned as a result of going on them. Questions on the above listed topics were found on quizzes as each topic was covered in one or more chapters.</p>	<p>17 students completed the course with a grade of C or better, 100% of them stated that the SLO had been adequately met and to explain why they believed so.</p> <p>Students did well with the new lab manual. Seventeen assignments were completed with a high of 80% and a low of 65%. Students with low scores did not complete the lab manual activities. Four lecture exams, three lab exams, and a field trip report were completed with a high of 92% and a low of 70%.</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: students had adequate time during class to work on lab activities. What is needed is a way to convince them that time spent on lab activities does not mean go home early that meeting. There were always students who would stay but for the most part many would leave at the first chance and turn in incomplete lab activities. The</p>

				new COR which takes effect Spring 2014 has a recommendation to complete Math 50 prior to taking the class.
GEOG-001, Fall 2012 Physical Geography Bridenbecker PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.	Communication Skills Critical Thinking Skills Personal Development Information Competency	The final assessment was a questionnaire listing the SLO and students were asked to if they felt it was adequately covered during the semester. Processes relating to the formation of natural resources including air, weather and climate, water, and soil were assessed by exams and projects presented to the class.	21 students took the SLO Assessment worth 25 points. The high score was 25 and the low score was 12 with an average of 96%. All of the students felt the material was adequately covered.	A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships. Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies. The Environmental Studies program was updated to facilitate student transfer success based on program review. Course modification proposed: students did well on every aspect of the class and were satisfied with the results. The major issue was the difficulty or rigor of the class. Students felt it was too hard for a three unit class. The course outline of record will be rewritten reflecting current SLOs.
NR-001, Fall 2012 Conservation of Natural Resources Bridenbecker PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.	Communication Skills Critical Thinking Skills Personal Development Information Competency	Matter, energy, life evolution, biological communities, species interactions, biodiversity, biomes, and global patterns of life were analyzed in the first exam by numerous questions. Emphasis was placed on biological communities, biomes, and global patterns of life in part two of the exam where students were required to describe four of eight climographs by biome and to give detailed description of it. Students could do two other biomes for extra credit if desired. Species interactions were tested on part one by questions analyzing food chains, food pyramids, the carbon cycle, nitrogen cycle, and phosphorous cycle.	10 students took Exam 1, which was worth 50 points. The high score was 48 and the low score was 25 with an average of 77%. Students were allowed to use a note card and have advanced notification of which questions are going to be on Part 2 of the Exam, 85% of them did well on it. Average $85\% + 77\% = 81\%$	A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships. Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies. The Environmental Studies program was updated to facilitate student transfer success based on program review. Course modification proposed: the expectations of the SLO are too detailed and the course outline of record will be rewritten for the next class offering. The material in Unit 1 was subdivided differently and student achievement improved as a result of this change.
NR-001, Spring 2013 Conservation of Natural Resources Bridenbecker PLO3- Collaboratively analyze collected data using problem-based	Communication Skills Critical Thinking Skills Personal Development	Theories or processes relating to the formation of natural resources such as air, weather and climate, water and soil, and the sustainability and/or pollution of said resources were assessed in the three exams and the following questions from the take home exam.	15 students completed the course with a grade of C or better. 91% of them met the expectations of the SLO. Students met the criteria of the SLO. Students have 3-4 weeks to complete the final exam, which is adequate for 20 questions. The results of questions 3, 4, 5, 6, &15 are satisfactory with 13	A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships. Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill

<p>learning and communicate findings in written and oral forms.</p>	<p>Information Competency</p>	<p>3. Describe the types and effects of water pollution. Use information from pages 399-406 & Table 18.1 for your discussion.</p> <p>4. Explain water pollution control. Use information from pages 412-416.</p> <p>5. Discuss the information in Section 18-5 Water Legislation pages 417-419. Include a description of the nine legislative acts from Table 18.2.</p> <p>6. Describe the information in Section 18.3 Water Quality Today. Use information from pages 406-412.</p> <p>15. Discuss the information in Section 16.2 Major Types of Pollutants pages 348-356. Use information from Figure 16.4, & Figure 16.7.</p>	<p>of 17 students scoring above 90%. The high score was 100% and the low score was 50%.</p>	<p>deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modification proposed: student scores have improved significantly as a result of breaking the information into smaller pieces. The new COR which takes effect Spring 2014 will have new SLOs and subsequent assessment will reflect those.</p>
<p>Environmental Studies, Required or Restricted Elective Science Courses</p> <p>PLO3- Collaboratively analyze collected data using problem-based learning and communicate findings in written and oral forms.</p>	<p>Communication Skills</p> <p>Critical Thinking Skills</p> <p>Personal Development</p> <p>Information Competency</p>	<p>Various assessment methods</p>	<p>PLO3 Assessment Average (Percent) =</p> <p>$(1536.33/18) = 85.35\%$</p>	<p>A van is needed because students have serious transportation problem preventing them from attending field trips, conferences and internships.</p> <p>Much of the department's science equipment is outdated and needs replacement to ensure students do not transfer or enter the workforce with skill deficiencies.</p> <p>The Environmental Studies program was updated to facilitate student transfer success based on program review.</p> <p>Course modifications were proposed as listed above.</p>