Unit Missions

BPS Mission Statement

Mission statement

The Division of Biological and Physical Sciences serves as the academic unit at Delta State University that is staffed and funded for the purposes of teaching and advising, conducting scholarly activities, and providing public/professional service work in the natural sciences.

Learning Outcomes

BS-BIO 01: Communication Skills

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome
Develop written communication skills appropriate for the sciences

Data Collection (Evidence)
Background: Students working on the BS in Biology degree at DSU are required to take three 300-level core courses covering the fundamental topics of cell biology, ecology, and genetics. As part of the final grade, each of these courses requires students to submit written assignments that assess substantive understanding of biological concepts and that are presented in a logical style.

1. From BIO 300 - Cell Biology
   Students enrolled in this course are required to complete a technical paper on an instructor-approved topic in cell biology, following a format used by many biological journals. 75 percent of students will receive a C grade or better on the paper.
2. From BIO 301 - Ecology
   Students enrolled in this course must submit a research paper on an instructor-approved topic in ecology, following the formatting guidelines used by most ecology journals. 75 percent of students will receive a C grade or better on the paper.
3. From BIO 328 - Genetics
   Students enrolled in this course are required to submit specific format laboratory reports written using data collected during the course, and analysis of data, about the outcomes of Drosophila crosses. 75 percent of students will receive a C grade or better grade averaged over all lab reports.

Results of Evaluation

1. From BIO 300 - Cell Biology
   For Fall 2012, 25 of 28 students (89%) received satisfactory scores on the term paper (performed at C or better level). For Spring 2013, 16 of 16 students (100%) received satisfactory scores on the term paper (performed at C or better level). For Summer 2013, 13 of 17 students (76%) received satisfactory scores on the term paper (performed at C or better level).
2. From BIO 301 - Ecology
   For the Fall 2012 semester the average score on research reports was 87.30% and 23 of 23 (100%) performed at a C or higher level. For the Spring 2013 semester the average score on the research reports was 81.48 and 24 of 25 (96%) performed at a C or higher level.
3. For Fall 2012, the average score on lab reports was 89%, and 26 of 27 students (96%) mastered all assigned activities (performed at C or better level). For Spring 2013, the average score on lab reports was 81%, and 20 of 25 students (81%) mastered all assigned activities (performed at C or better level).

Use of Evaluation Results

1. From BIO 300 - Cell Biology
   Some student who did not attain C or better chose a topic to work on early enough. Some did not submit drafts to the instructor for review and guidance as advised. Some of those who failed to attain C grade did not follow the paper writing guidelines. In future, the paper topics will be included in the syllabus, and students will be required to confirm choices of their topics in good time. Students will be required to follow a timeline in working on their papers and submit draft for review and guidance. More suggestions will be given on how to improve the breadth and depth of the term papers.
2. From BIO 301 - Ecology
   Due to construction, students were not able to conduct research projects for the Fall 2012 and Spring 2013 semesters. The research papers for these semesters consisted of a literature review on a topic of the students choosing. Even though the goal was achieved during these semesters, the outcome could have been better. Some students waited until very late in the semester to begin work on the review paper and this was reflected in lower scores. In addition, during Spring 2013 one student did not turn in a paper. A scoring rubric is being developed and will be provided to the students and used to grade research/ review papers starting with the Fall 2013 semester.
3. From BIO 328 - Genetics
   Lab report scores exceeded the goal, however, some students who did not perform at the C level simply did not complete all work. In future semesters, report deadlines will be modified, and additional reminders will be given that the reports are coming due so that students might get them finished in time and not run out of time to prepare them properly. Lab report directions will be modified to make it clearer to students exactly what a successfully written report should look like.
4. The data indicate some ability to communicate scientific information. Students would additionally benefit from oral communication experience in the form of scientific presentations. Robust and vigorous curriculum committee meetings are being held to plan for possible changes. A subcommittee has been formed to explore the feasibility of adding a capstone seminar course to the degree requirements.

BS-BIO 02: The Scientific Method

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome

Demonstrate proficiency with the scientific method through answering questions using the scientific method

Data Collection (Evidence)

Background: Students working on the BS in Biology degree at DSU are required to take three 300-level core courses covering the fundamental topics of cell biology, ecology, and genetics. As part of the final grade, each of these courses requires students to submit laboratory reports in which they document laboratory exercises requiring the steps of the scientific method: generating hypotheses, performing experiments, analyzing data, and deriving conclusions.

1. From BIO 300 - Cell Biology
   Students enrolled in this course are required to complete laboratory reports documenting use of the scientific method related to cell-related experiments. 75 percent of students will receive a C grade or better grade averaged over all lab reports.
2. From BIO 301 - Ecology
   Students enrolled in this course must submit weekly lab reports identify the components of the

scientific method as related to ecological exercises. 75 percent of students will receive a C grade or better grade averaged over all lab reports.

3. From BIO 328 - Genetics
   Students enrolled in this course are required to submit specific format laboratory reports written using data collected during the course, and analysis of data, about the outcomes of Drosophila crosses. 75 percent of students will receive a C grade or better grade averaged over all lab reports.

Results of Evaluation

1. From BIO 300 - Cell Biology
   For Summer 2012, 14 of 14 students (100%) obtained an average score of C or better on lab reports. For Fall 2012, 26 of 30 students (87%) obtained an average score of C or better on lab reports. For Spring 2013, 14 of 15 students (93%) obtained an average score of C or better on lab reports. For Summer 2013, 15 of 17 students (88%) obtained an average score of C or better on lab reports.
2. From BIO 301 - Ecology
   For Fall 2012, the average score on lab reports was 70.83%, and 17 of 23 students (73.91%) performed at C or better. For Spring 2013, the average score on lab reports was 66.20%, and 17 of 25 students (68.00%) performed at C or better.
3. From BIO 328 - Genetics
   For Fall 2012, the average score on lab reports was 89%, and 26 of 27 students (96%) mastered all assigned activities (performed at C or better level). For Spring 2013, the average score on lab reports was 81%, and 20 of 25 students (81%) mastered all assigned activities (performed at C or better level).

Use of Evaluation Results

1. From BIO 300 - Cell Biology
   Some students who failed to attain C did not read the lab instruction in advance. Often this led to inability to complete the lab exercise on time. Some student failed to show up during labs that did not have a make-up option due to the types of materials used. Some students did not record or analyze the data as instructed. Some students did not respond to post-lab questions. In future, students will be required to demonstrate in some way that they read the lab instructions before the start of the labs. Students who are unable to attend their assigned labs will be advised to attend the alternate lab. Students will also be advised to revise their data analysis and graphing skills prior to labs that generate data that needs such analysis like tabulation and graphing.
2. From BIO 301 - Ecology
   Lab report scores for these semesters failed to meet the goal of 75% receiving a C or higher. Some students who did not perform at the C level on lab reports failed to submit all the reports or turned in incomplete reports. Additional reminders will be given that the reports are coming due so that students might get them finished in time and not run out of time to prepare them properly. A scoring rubric is being developed which will help the student understand what should be included on lab reports. The rubric will be implemented during the Fall 2013 semester.
3. From BIO 328 - Genetics
   Lab report scores exceeded the goal, however, some students who did not perform at the C level simply did not complete all work. In future semesters, report deadlines will be modified, and

additional reminders will be given that the reports are coming due so that students might get them finished in time and not run out of time to prepare them properly. Lab report directions will be modified to make it clearer to students exactly what a successfully written report should look like.

4. The curriculum committee has discussed using a common rubric to evaluate scientific research. Such a rubric made be implemented in courses where appropriate in the future to assess investigation skills.
5. Also under consideration is the creation of an additional outcome that would relate to developing skills in the use of technology.

BS-BIO 03: Fundamental Concepts

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome
Demonstrate knowledge of fundamental concepts in biology in broad categories such as cellular biology, genetics, and ecology

Data Collection (Evidence)
Background: Students working on the BS in Biology degree at DSU are required to take three 300-level core courses covering the fundamental topics of cell biology, ecology, and genetics. Because these core courses expand on basic biological concepts which students first experience in introductory biology and are required for all biology majors, success in these courses is used as the assessment of content considered necessary for all biology majors.

1. From BIO 300 - Cell Biology

Students enrolled in this course are required to learn the details of principles relating to the structure and function of cells. 75 percent of students will receive a grade of C or better on the final exam, which comprehensively tests content covered in the course.

2. From BIO 301 - Ecology

Students enrolled in this course are required to learn the details of ecological principles, developing an understanding of the interactions between organisms and their environment. 75 percent of students will receive a grade of 65% or better on the final exam, which comprehensively tests content covered in the course.

3. From BIO 328 - Genetics

Students enrolled in this course are required to learn the details of genetics including classical (Mendelian) genetics, molecular genetics, and population genetics. 75 percent of students will receive a grade of 65% or better on the final exam, which comprehensively tests content covered in the course.

Results of Evaluation

1. From BIO 300 - Cell Biology

For Summer 2012, 11 of 14 students (79%) obtained a score of C or better on the final exam. For Fall 2012, 21 of 27 students (78%) obtained a score of C or better on the final exam. For Spring 2013, 10 of 15 students (67%) obtained a score of C or better on the final exam. For Summer 2013, 13 of 17 students

(76%) obtained a score of C or better on the final exam.0

2. From BIO 301 - Ecology

For Fall 2012, the average score on the final exam was 80.93%, and 20 of 23 students (86.96%) obtained a score of 65% or above. For Spring 2013, the average score on the final exam was 77.31%, and 21 of 25 students (84%) obtained a score of 65% or above.

3. From BIO 328 – Genetics

For Fall 2012, the average score on the final exam was 68%, and 19 of 27 students (70%) obtained a score of 65% or above. For Spring 2013, the average score on the final exam was 56%, and 14 of 25 students (56%) obtained a score of 65% or above.

Use of Evaluation Results

1. From BIO 300 - Cell Biology

Some students don't score C or better because they did not prepare adequately for the final examination. Some did not use the chapter review questions that are always included at the end of every chapter. Some were not able manage their time well during the final examination and were not able to finish on time. In future semesters students will be impressed upon the importance of using the review questions and proper time management when taking examinations. They will also be requested to constantly refer to the guidelines on how to succeed in cell biology, whose link will be added as part of the course on Canvas.

2. From BIO 301 - Ecology

The goal of 75% of the students receiving 65% or higher on the final exam was achieved for the Fall 2012 and Spring 2013 semesters. Ecology includes many concepts that draw on a student's critical thinking and problem solving skills. Many of the test items on ecology exams require these skills. The course content, delivery methods, level of rigor, and exam difficulty are being evaluated to identify changes that can be made in the course to improve student performance at the end of the semester as indicated by the final exam score. In subsequent semesters, more class time will be devoted to working assigned homework problems, and tutorial sessions will be held for students who need additional help developing these skills. Also, performance on specific categories of test items will be examined to note which concepts students are finding the most difficult. Special attention will be paid to these concepts in future offerings of the course.

3. From BIO 328 - Genetics

The course content, delivery methods, level of rigor, and exam difficulty are being evaluated to identify changes that can be made in the course to improve student performance at the end of the semester as indicated by the final exam score. Genetics includes many concepts that draw on a student's critical thinking and problem solving skills. Many of the test items on genetics exams require these skills. In subsequent semesters, more class time will be devoted to working assigned homework problems, and tutorial sessions will be held for students who need additional help developing these skills. Also, performance on specific categories of test items will be examined to note which concepts students are finding the most difficult. Special attention will be paid to these concepts in future offerings of the course.

The curriculum committee is investigating the use of a standardized exit exam to be taken by graduating students to further assess their overall knowledge of biological principles. Both nationally-normed exams and locally-created instruments are being considered.

BS-BIO 04: Data Assessment

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome
Demonstrate the skill to assess and analyze data with objectivity

Data Collection (Evidence)
Background: Students working on the BS in Biology degree at DSU are required to take three 300-level core courses covering the fundamental topics of cell biology, ecology, and genetics. Because these core courses expand on basic biological concepts which students first experience in introductory biology and are required for all biology majors, success in these courses is used as the assessment of content considered necessary for all biology majors.

1. From BIO 300 - Cell Biology

Students enrolled in this course are required to complete laboratory reports which include describing how data was collected and how conclusions were drawn from analysis of the data. 75 percent of students will receive a C grade or better grade averaged over all lab reports.

2. From BIO 301 - Ecology

Students enrolled in this course are required to complete laboratory reports which include describing how data was collected and forming conclusions from analysis of the data. 75 percent of students will receive a C grade or better grade averaged over all lab reports.

3. From BIO 328 - Genetics

Students enrolled in this course are required to complete laboratory reports which include describing how data was collected and how conclusions were drawn from analysis of the data. 75 percent of students will receive a C grade or better grade averaged over all lab reports.

Results of Evaluation

1. From BIO 300 - Cell Biology
   For Summer 2012, 11 of 14 students (79%) obtained a score of C or better on the final exam. For Fall 2012, 21 of 27 students (78%) obtained a score of C or better on the final exam. For Spring 2013, 10 of 15 students (67%) obtained a score of C or better on the final exam. For Summer 2013, 13 of 17 students (76%) obtained a score of C or better on the final exam.
2. From BIO 301 - Ecology
   For Fall 2012, the average score on lab reports was 70.83%, and 17 of 23 students (73.91%) performed at C or better. For Spring 2013, the average score on lab reports was 66.20%, and 17 of 25 students (68.00%) performed at C or better.
3. From BIO 328 - Genetics
   For Fall 2012, the average score on lab reports was 89%, and 26 of 27 students (96%) mastered all assigned activities (performed at C or better level). For Spring 2013, the average score on lab reports was 81%, and 20 of 25 students (81%) mastered all assigned activities (performed at C or better level).

Use of Evaluation Results

1. From BIO 300 - Cell Biology

Some students who failed to attain C did not read the lab instruction in advance. Often this led to inability to complete the lab exercise on time. Some student failed to show up during labs that did not have a make-up option due to the types of materials used. Some students did not record or analyze the data as

instructed. Some students did not respond to post-lab questions. In future, students will be required to demonstrate in some way that they read the lab instructions before the start of the labs. Students who are unable to attend their assigned labs will be advised to attend the alternate lab. Students will also be advised to revise their data analysis and graphing skills prior to labs that generate data that needs such analysis like tabulation and graphing.

2. From BIO 301 - Ecology

Lab report scores for these semesters failed to meet the goal of 75% receiving a C or higher. Some students who did not perform at the C level on lab reports failed to submit all the reports or turned in incomplete reports. Additional reminders will be given that the reports are coming due so that students might get them finished in time and not run out of time to prepare them properly. A scoring rubric is being developed which will help the student understand what should be included on lab reports. The rubric will be implemented during the Fall 2013 semester.

3. From BIO 328 - Genetics

Lab report scores exceeded the goal, however, some students who did not perform at the C level simply did not complete all work. In future semesters, report deadlines will be modified, and additional reminders will be given that the reports are coming due so that students might get them finished in time and not run out of time to prepare them properly. Lab report directions will be modified to make it clearer to students exactly what a successfully written report should look like.

Also under consideration for the next academic year is modifying this outcome or creating an additional outcome that would relate to developing skills in the use of technology.

BS-CHE 01: Literature Search

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome
Conduct literature search

Data Collection (Evidence)

1. The assessment tool is a laboratory assignment in searching an electronic database of journals.
2. The library search is graded as a laboratory assignment.
3. If at least 70% of students score 70% on the assignment, success is demonstrated.

Results of Evaluation
Only 40% of the class scored above 70% on the assignment. This indicates failure.

- Chemistry_Exam_Question_Analysis_1112

Use of Evaluation Results

1. Not all of the students performed the assignment. Since they didn't take it seriously enough, I have decided to increase the point value of this lab for the next year.
2. No change is being made since the difficulty level of the assignment was deemed quite challenging.

BS-CHE 02: Laboratory Report

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome

Write technical laboratory report

Data Collection (Evidence)

1. The assessment tool is the student's cumulative lab report grade for CHE 311.
2. The data is collected by separating the student's lab grade from the final course average as per the syllabus.
3. An average lab report score is calculated for all labs submitted for grading. If at least 75% of students score > 75% on the lab report score, success is demonstrated.

Results of Evaluation

5 of 6 students scored above 75% on the lab report portion. This represents 83% of the class, success is demonstrated.

- Chemistry_Exam_Question_Analysis_1112

Use of Evaluation Results

For smaller class sizes in the future, a PowerPoint presentation requirement may be added to give students practice in presenting technical data before audiences.

BS-CHE 03: Chemical Calculations

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome

Demonstrate broad knowledge base through critical thinking in chemical calculations

Data Collection (Evidence)

1. The assessment tool is Chapter Test 1, which is composed primarily of chemical calculations.
2. The data is collected by separating the students' Test 1 grade. Dropped or missed grades count as a score less than 70%.
3. If at least 50% of students score greater than or equal to 70% on Chapter Test 1, success is demonstrated.

Results of Evaluation

3 of 6 students scored at or above 70% on Chapter Test 1. This represented 50% of the class, success is demonstrated.

Use of Evaluation Results

Additional homework problems similar to the test problems will be assigned. We will also try more student work during class time on the white board using similar calculations.

BS-CHE 04: Best Safety Practices

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences
Learning Outcome
Demonstrate best safety practices of experimental techniques

Data Collection (Evidence)

1. After instruction on a safety unit, students were given a laboratory manual generated quiz.
2. These questions on general safety and safety while performing laboratory techniques were analyzed by grading.
3. If at least 70% of the students score 70% on the quiz, success is demonstrated.
4. A laboratory safety question will be tracked on the 2nd semester laboratory final examination. If at least 70% of the students get the correct answer, success is achieved.
5. A laboratory technique question was also probed on the 2nd semester laboratory final examination. If at least 70% of the students get the correct answer, success is achieved.

Results of Evaluation

1. 26 out of 27 scored a 70% or higher on the safety unit quiz. One student did not turn the quiz in for grading. Success is achieved.
2. 23 out of 23 or 100% of the students answered the safety question on the laboratory final correctly. Success is achieved.
3. 82.6% of the students answered the laboratory technique question at 70% efficiency. Success is achieved.

- Chemistry_Exam_Question_Analysis_1112

Use of Evaluation Results

1. More laboratory questions will be tracked on the 2nd semester final laboratory examination.
2. The technique question on the 2nd semester laboratory final examination seems adequate to test students' knowledge.

BS-CHE 05: Chemistry and Technology

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences
Learning Outcome
Utilize computational chemistry and instrumentation technology

Data Collection (Evidence)

1. The assessment tool is a laboratory assignment using the computational chemistry program, SPARTAN.
2. This assessment is graded the same as other laboratory assignments.
3. If at least 70% of the students score 70% on the assignment, success is demonstrated.

Results of Evaluation
80.0% of the class scored 70% or higher, which indicates success.

- Chemistry_Exam_Question_Analysis_1112

Use of Evaluation Results

1. A review of the assignment was conducted, and although successful some modest changes to the assessment tool will be made.
2. No change is being made since the class size is small and class performance varies from year to year.

BS-CHE 06: Chemical Reactivity

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences
Learning Outcome
Demonstrate a broad knowledge base through critical thinking for problem solving in chemical reactivity

Data Collection (Evidence)

1. The 1991 Organic Chemistry Final Examination is a comprehensive two semester exam produced by the American Chemical Society Examination Institute.
2. It was administered as a pretest at the beginning of the 2nd semester and used as a final exam at the end of term.
3. If 65% of the students score higher on the post- test than on the pretest, success is achieved.

Results of Evaluation

1. Only 60% of students made improvements on pre and post- test scores. Success is not achieved.
2. Only 45.8% of the students scored a 65 or higher on the final examination.

- Chemistry_Exam_Question_Analysis_1112

Use of Evaluation Results
Students will be required to work problems online through Mastering Chemistry. The publishing company through Mastering Chemistry provides resources such as homework feedback, videos, and tutorials to help students achieve a better level of success. It should be noted that the 1994 and not the 1991 Organic Chemistry Final Examination was given in the 2011-2012 academic year.

BS-ENV 01: Written Communication Skills

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome
Students will demonstrate technical writing ability that will permit communication with the scientific community about environmental science.

Data Collection (Evidence)
Background: All students working on the BS in Environmental Science degree at DSU are required to take two core courses covering fundamental topics related to the field of environmental science. As part of the final grade, each of these courses requires students to submit written assignments that assess substantive understanding of environmental science concepts and that are presented in a logical style. The Biology course is currently used to measure the achievement of the outcome.

From BIO 301 - Ecology
Students enrolled in this course must submit a research paper on an instructor-approved topic in ecology, following the formatting guidelines used by most ecology journals. The outcome is achieved if 75% of the students receive a grade of C or better on the research paper.

Results of Evaluation
From BIO 301 - Ecology
For the Fall 2012 semester the average score on research reports was 87.30% and 23 of 23 (100%) performed at a C or higher level. For the Spring 2013 semester the average score on the research reports was 81.48 and 24 of 25 (96%) performed at a C or higher level.

Use of Evaluation Results
1. From BIO 301 - Ecology
Due to construction, students were not able to conduct research projects for the Fall 2012 and Spring 2013 semesters. The research papers for these semesters consisted of a literature review on a topic of the students choosing. Even though the goal was achieved during these semesters, the outcome could have been better. Some students waited until very late in the semester to begin work on the review paper and this was reflected in lower scores. In addition, during Spring 2013 one student did not turn in a paper. A scoring rubric is being developed and will be provided to the students and used to grade research/ review papers starting with the Fall 2013 semester.

2. BIO 301 is one of only two science courses that are taken by all environmental science majors. The curriculum committee is considering evaluating additional courses that are common to each degree concentration so as to obtain a more complete assessment of the degree program. BIO 415 - Materials and Methods in Environmental Science would be appropriate for the General and GIS concentrations, while BIO 321 - Wildlife Techniques and/or BIO 463 - Wildlife Habitat Management would be appropriate for the Wildlife Management concentration.

BS-ENV 02: The Scientific Method

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome
Students will conduct biological investigations using the scientific method.

Data Collection (Evidence)
Background: All students working on the BS in Environmental Science degree at DSU are required to take ecology, covering fundamental topics related to the field of environmental science and generating hypotheses, performing experiments, analyzing data, and deriving conclusions.

From BIO 301 - Ecology
Students enrolled in this course must submit weekly lab reports identify the components of the scientific method as related to ecological exercises. 75 percent of students will receive a C grade or better grade averaged over all lab reports.

Results of Evaluation
From BIO 301 - Ecology
For Fall 2012, the average score on lab reports was 70.83%, and 17 of 23 students (73.91%) performed at C or better. For Spring 2013, the average score on lab reports was 66.20%, and 17 of 25 students (68.00%) performed at C or better.

Use of Evaluation Results
1. From BIO 301 - Ecology
Lab report scores for these semesters failed to meet the goal of 75% receiving a C or higher. Some students who did not perform at the C level on lab reports failed to submit all the reports or turned in incomplete reports. Additional reminders will be given that the reports are coming due so that students might get them finished in time and not run out of time to prepare them properly. A scoring rubric is being developed which will help the student understand what should be included on lab reports. The rubric will be implemented during the Fall 2013 semester.

2. BIO 301 is one of only two science courses that are taken by all environmental science majors. The curriculum committee is considering evaluating additional courses that are common to each degree concentration so as to obtain a more complete assessment of the degree program. BIO 415 - Materials and Methods in Environmental Science would be appropriate for the General and GIS concentrations, while BIO 321 - Wildlife Techniques and/or BIO 463 - Wildlife Habitat Management would be appropriate for the Wildlife Management concentration.

BS-ENV 03: Fundamental Concepts

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome
Students will demonstrate knowledge of fundamental concepts in environmental science in broad categories such as ecology and geospatial analysis.

Data Collection (Evidence)
Background: All students working on the BS in Environmental Science degree at DSU are required to take ecology, covering fundamental topics related to the field of environmental science. Because this core course expands on basic concepts which students first experience in introductory biology and are required for all environmental science majors, success in these courses is used as the assessment of content considered necessary for all environmental science majors.

From BIO 301 - Ecology
Students enrolled in this course are required to learn the details of ecological principles, developing an understanding of the interactions between organisms and their environment. 75 percent of students will receive a grade of 65% or better on the final exam, which comprehensively tests content covered in the course.

Results of Evaluation
From BIO 301 - Ecology

For Fall 2012, the average score on the final exam was 80.93%, and 20 of 23 students (86.96%) obtained a score of 65% or above. For Spring 2013, the average score on the final exam was 77.31%, and 21 of 25 students (84%) obtained a score of 65% or above.

Use of Evaluation Results

1. From BIO 301 - Ecology

The goal of 75% of the students receiving 65% or higher on the final exam was achieved for the Fall 2012 and Spring 2013 semesters. Ecology includes many concepts that draw on a student's critical thinking and problem solving skills. Many of the test items on ecology exams require these skills. The course content, delivery methods, level of rigor, and exam difficulty are being evaluated to identify changes that can be made in the course to improve student performance at the end of the semester as indicated by the final exam score. In subsequent semesters, more class time will be devoted to working assigned homework problems, and tutorial sessions will be held for students who need additional help developing these skills. Also, performance on specific categories of test items will be examined to note which concepts students are finding the most difficult. Special attention will be paid to these concepts in future offerings of the course.

2. BIO 301 is one of only two science courses that are taken by all environmental science majors. The curriculum committee is considering evaluating additional courses that are common to each degree concentration so as to obtain a more complete assessment of the degree program. BIO 415 - Materials and Methods in Environmental Science would be appropriate for the General and GIS concentrations, while BIO 321 - Wildlife Techniques and/or BIO 463 - Wildlife Habitat Management would be appropriate for the Wildlife Management concentration.

BS-ENV 04: Data Analysis

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome

Students will demonstrate the skill to assess and analyze data with objectivity.

Data Collection (Evidence)

Background: All students working on the BS in Environmental Science degree at DSU are required to take ecology, covering fundamental topics related to the field of environmental science. This course requires students to perform experiments, collect data, analyze those data, and draw conclusions based on their analysis.

From BIO 301 - Ecology

Students enrolled in this course are required to complete laboratory reports which include describing how data was collected and forming conclusions from analysis of the data. 75 percent of students will receive a C grade or better grade averaged over all lab reports.

Results of Evaluation

From BIO 301 - Ecology

For Fall 2012, the average score on lab reports was 70.83%, and 17 of 23 students (73.91%) performed at C or better. For Spring 2013, the average score on lab reports was 66.20%, and 17 of 25 students (68.00%) performed at C or better.

Use of Evaluation Results

1. From BIO 301 - Ecology

Lab report scores for these semesters failed to meet the goal of 75% receiving a C or higher. Some students who did not perform at the C level on lab reports failed to submit all the reports or turned in incomplete reports. Additional reminders will be given that the reports are coming due so that students might get them finished in time and not run out of time to prepare them properly. A scoring rubric is being developed which will help the student understand what should be included on lab reports. The rubric will be implemented during the Fall 2013 semester.

2. BIO 301 is one of only two science courses that are taken by all environmental science majors. The curriculum committee is considering evaluating additional courses that are common to each degree concentration so as to obtain a more complete assessment of the degree program. BIO 415 - Materials and Methods in Environmental Science would be appropriate for the General and GIS concentrations, while BIO 321 - Wildlife Techniques and/or BIO 463 - Wildlife Habitat Management would be appropriate for the Wildlife Management concentration.

MAS-GIT 01: GIT Application and Methodology

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome

Students will learn fundamental knowledge and applications of GIT, and needed skills related to communicate spatial information and methodological techniques.

Data Collection (Evidence)

1. From REM 616 - Remote Sensing

All MAS students are required to master the basic principles on which remote sensing is based, and how aerial and satellite remote sensing data (VIS, VNIR, SWIR, Thermal IR, RADAR, LiDAR) are acquired, processed and eventually applied in various fields. All the students are required to receive a B grade or better for this class.

2. From REM 611 - Digital Image Processing

All MAS students are required to master the digital image basics from data format, storage, to image formation, theory and techniques of image interpretation, rectification, restoration, correction, enhancement and classification, applications of feature extraction and change detection for Earth resources management using airborne and satellite images.

Results of Evaluation

1. From REM 616 - Remote Sensing

80% of the students in REM616-Remote Sensing received A and 20% of the students received B for the AY 2012-13. The average score of the cohort was above B.

2. From REM 611 - Digital Image Processing

43% of the students in REM 611- Digital Image Processing received A and 57% of the students received B for the AY 2012-13. The average score was above B.

Use of Evaluation Results

1. From REM 616 - Remote Sensing

Most students had a good understanding of remote sensing fundamentals. A pretest of remote sensing basics was given prior to the class and one-to-one tutoring was given to some students who had less background. This kind of tutoring is found to be helpful and should be continued in future years.

2. From REM 611 - Digital Image Processing

Students who did not reach A level experienced difficulties using computers to do the image analysis. Sometimes they were stuck in computer labs although the step-by-step instructions and screen-shots were provided. One student had frequent campus visits to seek in-person guidance. Computer labs are essential for students to gain hands-on experience. However, online teaching lacks face-to-face interactions. Some in-state students can have campus visits for guidance while it is difficult for out-of-state students. A discussion board can be helpful for students discussing problems they encounter. In future teaching, online discussion function will be tried for this purpose.

MAS-GIT 02: Geospatial Analysis

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome

Students will demonstrate foundational skills needed to perform complex geospatial analyses. They will develop a working knowledge of ArcGIS, ENVI, and other contemporary GIT-related tools used in developing and implementing geospatial strategies.

Data Collection (Evidence)

Background: MAS students are required to master GIT techniques and adequate hands-on experience to utilize GIT software and tools. The techniques of preparing datasets, creating maps, and performing spatial analysis should be readily transferable to their future work places.

All students enrolled in REM 611-Digital Image Processing are required to complete 6 computer labs, take a final exam and propose a course project to demonstrate their understanding of principles in image analysis, competency of using ENVI and ArcGIS to analyze image data. They are required to figure out the methods of integrating these two software and other GIS-related tools (Google Earth, USGS Earth Explorer etc.) to produce image products with professional map legends for user reading and submit lab reports with their interpretation to images.

Results of Evaluation

71% of the students in the REM 611 - Digital Image Processing received A for the average of computer labs and 29% received B. 87% of the students received A for the research proposal. The average score of this class was above B.

Use of Evaluation Results

Some students who received B were not able to integrate technologies from different classes to perform the project. Some knowledge can be front-loaded as a preparation for this advanced level class. For this reason, REM 616 will be offered in fall semester in 2013 to lay a foundation for REM 611 in spring semester

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MAS-GIT 03: Proposal Development

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences
Learning Outcome
Students will demonstrate ability in developing research proposal and communicating project process in written, oral, and graphic media at a professional level.

Data Collection (Evidence)
Background: MAS students are required to submit lab reports for each computer labs assigned, write research proposals, communicate research ideas with the advisor prior to the formation of proposal and in the course of conducting research.

All students enrolled in REM 611-Digital Image Processing must complete lab reports for documenting the implementation of labs, analysis of results and related discussions. Students will receive B grade or above averaged over all lab reports. They are required to submit a 3-5 page research proposal to clearly demonstrate the design of project and methodology of carrying out research, provide a flowchart of research steps, and write progress reports to the instructor.

Results of Evaluation
57% of students in the REM 611-Digital Image Processing received A averaged over all lab reports. 87% students received A for the research proposal.

Use of Evaluation Results
Students who received B averaged over all lab reports lacked clear explanation of their results and submitted reports without or with limited explanation for images. Students who received B for the research proposal could not explicitly describe the research to readers. They could talk very well while could not express clearly in written form. In the future, more training on scientific writing will be provided from the beginning of program.

MAS-GIT 04: Independent Research

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences
Learning Outcome
Students will demonstrate critical thinking and independent research ability. They will be able to propose original research topic, conduct literature review, plan, implement, and execute a comprehensive GIS project.

Data Collection (Evidence)
Background: All students in the MAS program must design, develop and complete a major individual project that solves a real-world problem by applying GIS, remote sensing and GPS knowledge and skills. The project involves experiments and analysis, database and systems design, software development, systems implementation and eventual deployment.
All students enrolled in GIS 690-Capstone Project must write a research proposal to describe their design of project, plan the timeline for conducting the project, and submit weekly progress reports. Upon the completion of project, students are required to submit a final project report.

Results of Evaluation

71% of students in the GIS 690-GIS Capstone has finished the project and submitted the first draft of report in mid-July 2013 as required. 29% students are in progress. The class will end in the end of July. All students are expected to finish on time.

Use of Evaluation Results

Students who have not finished the project did not balance the work and study very well. Two students had business trips and summer field work for their jobs. They did not manage the time well and asked for extra time for the project. Letting students plan the project early in the spring semester was found to be very helpful. The timeline of program and classes were stressed in spring. Weekly progress reports reminded students to stay on track and ensured the completion of project on time.

MAS-GIT 05: Laboratory and Field Experiments

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences

Learning Outcome

Students will learn how to operate cutting-edge geospatial instruments to collect, process and visualize the data. Students will learn the data management skills from laboratory and field experiments, and computer simulation.

Data Collection (Evidence)

Background: MAS students are required to master the techniques in using GIT-related instruments for data acquisition and the subsequent data analysis. They are required to participate or watch the videos of their cohorts conducting field practice. All the students are required to process and analyze collected data.

1. From REM 616 - Remote Sensing
   Students enrolled in REM 616-Remote Sensing were arranged to watch the videos of laboratory and field experiments recorded in the last year. They learned techniques of using a modern Garmin 550T Tracking GPS, a hyperspectral field spectrometer, a digital camera with GPS settings, an airborne hyperspectral mission. A computer lab was assigned for analyzing the collected data.
2. From GIS 631-Photogrammetry
   Students enrolled in GIS 631-Photogrammetry were given the practice of simulating flight plan and 3-D flight line for data acquisition. They learned the factors to be considered for airborne remote sensing and photogrammetric data collection, and methods of measuring geographic elements from photogrammetric products.

Results of Evaluation

1. From REM 616 - Remote Sensing
   Students demonstrated extremely strong interest in the real-world experiments. 100 % students did extra research motivated by these experiments and received A grade for this lab.
2. From GIS 631-Photogrammetry
   Students liked the simulation of flying aircraft over various topography and acquisition of photogrammetric products using 3-D simulation in ENVI software. The lab was assigned to measure geographical elements from the photogrammetric products collected.

Use of Evaluation Results
More similar real-world experiments or simulations will be designed for student interest and practice. A research project has been funded by the OIT Challenge Grant. Students can use the funded equipment to build a geospatial database. The database and resources will be used in future teaching and GIS 690 research project.

MSNS-01: Critical Thinking

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences
Learning Outcome
Students will demonstrate critical thinking in their critique of a scientific article from a peer reviewed journal.
Data Collection (Evidence)
Students will be monitored in an upper level course by a review of their critique of peer reviewed journal articles.
Results of Evaluation
Four MSNS students in the Biology track enrolled in BIO 601 selected articles from an area of interest to them, and successfully critiqued those articles.

Use of Evaluation Results
Faculty are continuing discussions on effective means of measuring common learning outcomes for a diverse student population. Because students take different courses, this may become a checklist item on the graduation requirements checklist.

MSNS-02: Written Communication Skills

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences
Learning Outcome
Students will demonstrate writing communication skills through technical writing.
Data Collection (Evidence)
Students will be monitored in an upper level course by assessing their ability to write a 10-15 page paper in the field.
Results of Evaluation
All four MSNS students enrolled in BIO 601 successfully completed a literature review paper with a grade of 85 or higher. One of these students was unsuccessful in the first attempt, but after feedback was provided, revisions were made and the second attempt was very good.

Use of Evaluation Results
Not all MSNS students take this course. There are no common courses for all three tracks.
Faculty are continuing discussions on effective means of measuring common learning outcomes for a diverse student population.

MSNS-03: Independent Research

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences
Learning Outcome
Students will demonstrate the ability to conduct independent research.

Data Collection (Evidence)
Students will be assessed by a presentation on their research findings.

Results of Evaluation
Two students in the chemistry option conducted independent research. One of these students presented a poster at the Mississippi Academy of Science. One student in the Biology track presented research in a department seminar and has a publication in press. A second Biology student presented at a science teacher's meeting in the school district in which she is teaching.

Use of Evaluation Results
This requirement has been added to the graduation checklist and must be completed prior to sitting for oral examinations. If a suitable conference is not attended, students may choose to present to the DSU community or other venue, as agreed upon with the student's advisor.

MSNS-04: Oral Communication

Start: 7/1/2012
End: 6/30/2013
Providing Department: Biological and Physical Sciences
Learning Outcome
Students will demonstrate proficiency in oral science communication.

Data Collection (Evidence)
Students will be assessed by sitting for oral master examinations upon completion of research and coursework.

Results of Evaluation
The two students in the Chemistry option both passed their oral masters examinations. This involves being questioned about previous class material by three faculty committee members. Two students in the Biology Education option both passed their oral masters examinations. A total of four students graduated from the MSNS program upon completion of this requirement.

Use of Evaluation Results
Although all eligible students passed in 12-13, there is not much discrimination in the data. A common rubric will be implemented that rates students as follows: Fail, Marginally Pass, Average, Above Average and Outstanding in several key categories. Students who Fail will be given instruction and opportunity to remediate the problem.

Gen Ed Learning Outcomes

BIO_100_GE01: Critical and Creative Thinking

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Developing sound analytical and reasoning skills and the ability to use them to think critically, solve problems, analyze logically and quantitatively, and effectively respond to change

Data Collection
Students enrolled in BIO 100 take a pre-test and post-test covering basic concepts of biology. Many of the item on this test assess critical thinking and problem solving. Goal: 75% of students will show an improvement of at least 5 percentage points from pre-test to post-test.

Results of Evaluation
For Fall 2012, the average pre-test score was 47%. The average post-test score was 57%. Out of 162 students, 114 improved their scores by 5% or more (70% of students). For Spring 2013, the average pre-test score was 47%. The average post-test score was 58%. Out of 51 students, 36 improved their scores by 5% or more (71% of students).

Use of Results
Although we nearly reached the goal of 5% improvement, instructors of this course recognize that much improvement in student achievement is needed. We would prefer a more significant gain than this. Further analysis of pre-post test results are will be done to identify specific content areas that students are finding most challenging. BIO 100 instructors will discuss changes that can be made to those content areas to help increase understanding of basic biological concepts.

Related Items
GE 01: Critical and Creative Thinking

BIO_100_GE03: Quantitative Skills

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Enhancing abilities for symbolic and numeric reasoning and the ability to use and understand statistical and other quantitative techniques to interpret data

Data Collection
Students enrolled in BIO 100 take the Test of Integrated Process Skills (TIPS) test as a pretest and post-test. The TIPS assesses understanding of the scientific method, including analysis of quantitative data, hypothesis testing, and interpretation of graphs. Goal: 75% of students will show an improvement of at least 5 percentage points from pre-test to post-test.

Results of Evaluation
For Fall 2012, the average pre-test score was 64%. The average post-test score was 69%. Out of 151 students, 85 improved their scores by 5% or more (56% of students). For Spring 2013, the average pre-

test score was 68%. The average post-test score was 72%. Out of 51 students, 24 improved their scores by 5% or more (47% of students).

Use of Results
Although the average scores on the TIPS test were higher than on the content test (both pre-and post), fewer students reached the 5% improvement benchmark. This may be partly because more students entered the course with appropriate skills, leaving less room for improvement. But improvement is certainly needed. The laboratory portion of this course is primarily concerned the teaching science processes. Over the past few years, instructors of BIO 100 have redesigned the laboratory exercises. We will continue discussion of the new lab exercises focusing on ways to give students more experience with data analysis to improve their quantitative skills.

Related Items
GE 03: Quantitative Skills

BIO_100_GE04: Inquiry and Technology

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Building the skills for the search, discovery, evaluation, and application of information, including an understanding of the nature and limits of appropriate technologies

Data Collection
Students enrolled in BIO 100 take the Test of Integrated Process Skills (TIPS) test as a pretest and post-test. The TIPS assesses understanding of the scientific method, including understanding of technologies used in science and interpretation of experimental results. Goal: 75% of students will show an improvement of at least 5 percentage points from pre-test to post-test.

Results of Evaluation
For Fall 2012, the average pre-test score was 64%. The average post-test score was 69%. Out of 151 students, 85 improved their scores by 5% or more (56% of students). For Spring 2013, the average pre-test score was 68%. The average post-test score was 72%. Out of 51 students, 24 improved their scores by 5% or more (47% of students).

Use of Results
Although the average scores on the TIPS test were higher than on the content test (both pre-and post), fewer students reached the 5% improvement benchmark. This may be partly because more students entered the course with appropriate skills, leaving less room for improvement. But improvement is certainly needed. Over the past few years, instructors of BIO 100 have redesigned the laboratory exercises. We will continue discussing the new lab exercises, exploring new ways to use more technology, such as incorporating data acquisition using the Vernier systems recently acquired through the Title III grant. This should help students to develop better science inquiry skills and increase their experience with the scientific process.

Related Items

BIO_110_GE04: Inquiry and Technology

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Building the skills for the search, discovery, evaluation, and application of information, including an understanding of the nature and limits of appropriate technologies

Data Collection
Skills pertaining to scientific discovery, evaluation, and application are emphasized throughout the course, and several assignments require use of library databases and internet resources. 15% of the final grade is based on a writing assignment in which students select a topic such as a human ailment, endangered species, or urban sprawl. The instructor reviews and returns the rough draft so that students can make appropriate revisions. Goal: 80% of the students will show an improvement on their final report.

Results of Evaluation
For Fall 2012, 82% of the students received a 80% grade or better on their written project. 91% of the students that turned in a rough draft improved their scores. In Spring 2013, 84.8% of the students received a 80% grade or better on their written project. 21% of the students did not turn in a rough draft; only 10% of these students received a grade higher than an 80% on their final report.

Use of Results
More students did better on their written project during the spring semester compared to the fall semester. The increase may have been based on more topic choices. Writing about a human disease like malaria was not a choice in the fall 2012 semester. However, the goal for 2013/2014 is to have 88% or more students to acquire an 80% grade or better on their written project. Ideas such as asking students for a list of their sources earlier in the semester may help students be more organized about the topics that they choose to pursue.

Related Items
GE 04: Inquiry and Technology

BIO_110_GE05: Self

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Developing a fundamental understanding of the intricate nature of humans and the knowledge, interests, and skills to promote well-being and health

Data Collection
Lecture, laboratory, and outside classroom assignments are used that generate student awareness of environmental problems such as population growth, global disease, and genetically engineered food. Five laboratory assignments are used to evaluate the competency. They require students to discuss their opinions orally and in written reports. These assignments count for 33% of a student's laboratory grade. The goal is for 80% of the students to achieve an 80% or better on these lab assignments.

Results of Evaluation
In Dr. Baghai-Riding's Fall 2012 sections, 63-89.5% of the students received a grade of 80% or better for the selected exercises. In Spring 2013, 68-84% of the students received a grade of 80% or better on the same labs. Dr. Baghai-Riding's class size was larger for spring semester (44 students completed the course in Spring 2013 compared to 38 students in Fall 2012).

Use of Results
Some of the low scores on these labs are related to absenteeism, students not wanting to do outside classroom assignments, and turning work in late. More effort in 2013/2014 will be made to complete the labs during lab time. More emphasis also will be placed on attending laboratory sessions. For example, a two-hour lab will be given two points whereas a one-hour lecture will be given one-point towards attendance. Attendance and classroom participation is worth 10% of their final grade.

Related Items
GE 05: Self

BIO_110_GE10: Values

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Facilitating the search for moral, social, and ethical values and their roles in making decisions and assuming personal responsibilities

Data Collection
Lecture, laboratory, and outside classroom assignments are used that generate student awareness of about biological issues that focus on population growth, applications of DNA (forensic studies, cloning, human genome project), and conservation issues (saving endangered species, destruction of ecosystems, etc.). Lecture exams are used to evaluate this learning objective. Major goal is for 80% of the students to receive an 80% or better on the three written exams.

Results of Evaluation
In Dr. Baghai-Riding's Fall 2012 semester, 60% of students scored 80% or better for exam 1, 47% for exam 2, and 45% for exam 3. In Dr. Baghai-Riding's Spring 2013 sections, 52% of students scored 80% or better for exam 1, 56% for exam 2, and 75% for exam 3. Dr. Baghai-Riding's class size was larger for spring semester (44 students completed the course in Spring 2013 compared to 38 students in Fall 2012).

Use of Results
Some of the low scores were due to students not turning in the assigned homework that is worth 20% of each exam, not attending review sessions, and not taking advantage of the study guide that is provided. More effort in 2013/2014 will be made to review class material during any extra lab time that is available. Distributing copies of the review sheet prior to class meetings also will be done. In the past, students were expected to locate the review sheet by going to the class website.

Related Items
GE 10: Values

CHE_101_GE01: Critical and Creative Thinking

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Developing sound analytical and reasoning skills and the ability to use them to think critically, solve problems, analyze logically and quantitatively, and effectively respond to change

Data Collection
The data will be collected in the fall semester by administering a 10 question pretest/ post-test. Success will be demonstrated if 70% of students will show improved scores on 70% of the post-test questions.

Results of Evaluation
100% of the students improved their scores on 90% of the questions.

Use of Results
The faculty are vigorously discussing on-going ways to improve students' outcomes in the problem area.

Related Items
GE 01: Critical and Creative Thinking

CHE_101_GE04: Inquiry and Technology

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Building the skills for the search, discovery, evaluation, and application of information, including an understanding of the nature and limits of appropriate technologies

Data Collection
The data will be collected from individual student scores on the Graphing Laboratory. If students achieve an average of 70% or greater (7 out of 10 points), student success is demonstrated.

Results of Evaluation
51 out of 54 (94%) scored ≥ 70%. Success is demonstrated.

Use of Results
The instructions on how to complete the graphing lab using computer software will be housed on Canvas (new LMS) for easy student access.

Related Items
GE 04: Inquiry and Technology

CHE_102_GE01: Critical and Creative Thinking

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Developing sound analytical and reasoning skills and the ability to use them to think critically, solve problems, analyze logically and quantitatively, and effectively respond to change

Data Collection
Data will be collected using a two semester American Chemistry Society Final Examination or a one semester American Chemistry Society Final Examination both designed to be administered at the end of CHE 102. If 50% of the students score 50% or higher on these final examinations, student success is achieved.

Results of Evaluation
Data from student responses was combined. 68 out of 68 (100%) scored ≥ %50. Success is demonstrated.

Use of Results
The benchmark for success will be raised to 60%. Assigned homework questions will be reviewed to challenge students.

CHE_102_GE04: Inquiry and Technology

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Building the skills for the search, discovery, evaluation, and application of information, including an understanding of the nature and limits of appropriate technologies

Data Collection
The data will be collected from individual student scores on the Colligative Properties Laboratory (Molar Mass Determination /Freezing Point Depression Experiment). If students achieve an average of 70% or greater (7 out of 10 points), student success is demonstrated.

Results of Evaluation
Data from three lab sections were combined. 70% of students (35/50) achieved 7 or higher out of 10 on the laboratory report. Success is achieved.

Use of Results
Vernier instrumentation was incorporated into the laboratory experience as a result of Title III funding. The experiment will be reviewed for optimization.

CHE_103_GE01: Critical and Creative Thinking

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Developing sound analytical and reasoning skills and the ability to use them to think critically, solve problems, analyze logically and quantitatively, and effectively respond to change

Data Collection
The data will be collected in the fall semester by administering a 10 question pretest/ post-test. Success will be demonstrated if 70% of students will show improved scores on 70% of the post-test questions.

Results of Evaluation
100% of the students improved their scores on 90% of the questions.

Use of Results
The faculty are vigorously discussing on-going ways to improve students' outcomes in the problem area.

Related Items
GE 01: Critical and Creative Thinking

CHE_103_GE04: Inquiry and Technology

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Building the skills for the search, discovery, evaluation, and application of information, including an understanding of the nature and limits of appropriate technologies

Data Collection
The data will be collected from individual student scores on the Graphing Laboratory. If students achieve an average of 70% or greater (7 out of 10 points), student success is demonstrated.

Results of Evaluation
51 out of 54 (94%) scored ≥ 70%. Success is demonstrated.

Use of Results
The instructions on how to complete the graphing lab using computer software will be housed on Canvas (new LMS) for easy student access.

Related Items
GE 04: Inquiry and Technology

CHE_104_GE01: Critical and Creative Thinking

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Developing sound analytical and reasoning skills and the ability to use them to think critically, solve problems, analyze logically and quantitatively, and effectively respond to change

Data Collection
Data will be collected using a two semester American Chemistry Society Final Examination or a one semester American Chemistry Society Final Examination both designed to be administered at the end of CHE 102. If 50% of the students score 50% or higher on these final examinations, student success is achieved.

Results of Evaluation
Data from student responses was combined. 68 out of 68 (100%) scored ≥ %50. Success is demonstrated.

Use of Results
The benchmark for success will be raised to 60%. Assigned homework questions will be reviewed to challenge students.

Related Items
GE 01: Critical and Creative Thinking

CHE_104_GE04: Inquiry and Technology

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Building the skills for the search, discovery, evaluation, and application of information, including an understanding of the nature and limits of appropriate technologies

Data Collection
The data will be collected from individual student scores on the Colligative Properties Laboratory (Molar Mass Determination /Freezing Point Depression Experiment). If students achieve an average of 70% or greater (7 out of 10 points), student success is demonstrated.

Results of Evaluation
Data from three lab sections were combined. 70% of students (35/50) achieved 7 or higher out of 10 on the laboratory report. Success is achieved.

Use of Results
Vernier instrumentation was incorporated into the laboratory experience as a result of Title III funding. The experiment will be reviewed for optimization.

Related Items
GE 04: Inquiry and Technology

CHE_110_GE01: Critical and Creative Thinking

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Developing sound analytical and reasoning skills and the ability to use them to think critically, solve problems, analyze logically and quantitatively, and effectively respond to change

Data Collection
Predetermined questions from tests 1, 2, and 3 will be assessed for mastery of concepts. If 60% of the students achieve 70% or above on selected questions, success is demonstrated.

Results of Evaluation
For the fall 2012-spring 2013 semesters, 89% of the students scored greater than 70% on the predetermined questions from tests 1, 2, and 3. Success is demonstrated.

Use of Results
More detailed PowerPoint information will be provided to address problem areas.

Related Items
GE 01: Critical and Creative Thinking

CHE_110_GE04: Inquiry and Technology

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Building the skills for the search, discovery, evaluation, and application of information, including an understanding of the nature and limits of appropriate technologies

Data Collection
The data will be collected from all 6 online- laboratories complete for each student. The overall average of all laboratory grades will be calculated. Success is achieved if 60% of the students achieve a 70% or above average.

Results of Evaluation
For the fall 2012-spring 2013 semesters, 89% of the students scored greater than 70% on the 6 online-laboratories. Success is demonstrated.

Use of Results
Future students will be provided a more detailed explanation in problem areas.

Related Items
GE 04: Inquiry and Technology

PHY_110_GE01: Critical and Creative Thinking

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)
Developing sound analytical and reasoning skills and the ability to use them to think critically, solve problems, analyze logically and quantitatively, and effectively respond to change

Data Collection
Data is collected by administering an exit exam for the spring 2013 semester that measures basic concept knowledge in 10 key areas mastered in the course. Success is achieved if the class average on the exit exam is 70% or higher.

Results of Evaluation
The class average on the exit exam for 17 students was 79.7%.

Use of Results
Mastery of each of the 10 individual concepts is measured, and modifications of teaching methods and materials are instituted for any concept for which a majority of students fail to achieve at 70% or better.

Related Items
GE 01: Critical and Creative Thinking

PHY_205_GE01: Critical and Creative Thinking

Start: 7/1/2012
End: 6/30/2013

Gen Ed learning outcome (competency)

Developing sound analytical and reasoning skills and the ability to use them to think critically, solve problems, analyze logically and quantitatively, and effectively respond to change

Data Collection

1. Data will be collected by analyzing pretest and post-test (final test). The pretest is administered the 2nd week of school to gauge student knowledge of astronomy.
2. Data from three different sections of PHY 205 will be collected and analyzed separately.
3. Success if achieved if students achieve an 80% or higher on the post-test/final test.

Results of Evaluation

1. For group 1 & 2 students who share same lecture but different laboratory periods, 21% of students passed the pretest (10 out of 47) and 85% of students passed the post-test/final test (85%). Success is achieved.
2. For group 3 students, 48% of students passed the pretest (14 out of 29) and 93% of students passed the post-test/final test (27 out of 29). Success is achieved.
3. For group 4 students, 35% of students passed the pretest (8 out of 23) and 87% of students passed the post-test/final test (20 out of 23 students). Success is achieved.

Use of Results

Analysis of the pretest allows for orientation in students' general knowledge in astronomy and allows assessment of students' abilities. Each class is treated separately. The level of beginning instruction is determined by the percentage on the pretest. Using teaching methodologies such as practical examples, movies, and animations, students are instructed in the basic concepts in astronomy.

Related Items

GE 01: Critical and Creative Thinking

Section IV.a
Brief Description
Narrative

The Division of Biological and Physical Sciences is the administrative home of three undergraduate degree programs (B.S. in biology, B.S. in chemistry, B.S. in environmental science) and two graduate degrees (M.S. in Natural Sciences, MAS-GIT in Remote Sensing). Several options, specifically designed for students pursuing certain career pathways, are available through each of these degree programs. The overwhelming majority of the students in the division identify themselves as working toward completion of requirements necessary for admission to professional school in medicine, dentistry, physical therapy, pharmacy, veterinary medicine, occupational therapy, and other allied health professions. The environmental science degree program offers students opportunities to acquire skills necessary to compete in a growing occupational market; and is working closely with DSU's Center for Interdisciplinary Geospatial Information Technologies to provide state-of-the-art resources to majors interested in solving big problems with contemporary solutions. A substantial contribution to the university is made by the division to providing science instruction to students as part of DSU's General Education Curriculum.

Section IV.b
Comparative data

Enrollment, CHP, majors, graduation rates, expenditures, trends, etc.

Narrative

Trend data for Biology and Physical Sciences for 2009-2013

Section IV.c
Diversity Compliance Initiatives and Progress
Narrative

The initial phases of the search for the new biochemist again took diversity into account as applications for the position were reviewed. The Division of Biological and Physical Sciences exists as one of the most diverse academic units on the Delta State University campus, and we are committed as a faculty to maintain the productive population of faculty members, staff, and students that we have.

Section IV.e
Grants, Contracts, Partnerships, Other Accomplishments
Narrative

Grants

"NanoDays Grant" awarded to A.P. Somlai and L. Fitts, through the National Science Foundation (NSF), allowing nanotechnology science outreach through hosting a Science Night and Girls Scout Science Night.

NSF GeoDemo presentation funding for Spring Research, Mini Symposia, and Intersession Summer Research Institute, coordinated with Brenda Kirtland at Mississippi State University, total funding $7350.

Renewed funding through a NASA subgrant from the University of Mississippi, administered by Dr. Chuck Smithhart, for the AY 2011-2012, Total award for the 2012-2013 AY is believed to be: $10,000. The NASA subgrant is not automatically awarded to the division and has to be reapplied for again each year.

Although awarded in previous years, spending continued for the following multi-year award grants:

EPA Grant, awarded to Nina Baghai-Riding; The Delta Environmental Education Project ("DEEP") will provide a two-week summer institute for teachers in grades 5-8 on environmental education, emphasizing Protecting America's Waters. - $78,712.00 (Due to problems with the awarding of government funds during the previous academic year, the EPA-funded workshops scheduled for Summer 2012 were moved

to Summer 2013). The following faculty members were used by the division as workshop instructors: Dr. Eric Blackwell, Dr. Tanya McKinney, Ms. Lacey Fitts, Dr. Chuck Smithhart, Dr. Nina Baghai-Riding, and Dr. Barry G. Campbell.

Collaborator, Nina Baghai-Riding, National History Collections: Magnolia grandiFLORA digitally linking herbaria to support botanical reach and education in Mississippi. NSF 11-558 - $94,031. This grant is coordinated with Lisa Wallace at Mississippi State University.

The division has completed almost all of Year 5 of the Title III grant, administered by John Tiftickjian. An extension was granted by the Department of Education for meeting the objectives of the grant into AY 2013-2014.

Section IV.f
Service Learning Data
List of projects, number of students involved, total service learning hours, number of classes, faculty involved, accomplishments.
Narrative
During the AY 2012-2013, there were two courses identified by the instructors as having significant service learning course curriculum components.

In BIO 340 General Entomology, course participants continued work initiated in previous years on the butterfly trail and garden at Dahomey National Wildlife Refuge. Additional plants designed to attract butterflies and other insects were planted at designated pointss on the refuge for the purpose of attracting Students in BIO 425/525 Medical and Veterinary Entomology continued to build a course web site focusing on providing information to the surrounding area concerning the biology of various medically-important arthropods (such as mosquitoes) and the diseases that are transmitted by these organisms. The web site permits students to contribute to local arthropod control efforts via the Centers for Disease Control (CDC)-promoted concept of "Community-Based Mosquito Control", which uses community education about invertebrate biology and disease transmission as the main approach to arthropod-based disease control in small networks of rural communities. The course instructor was Barry G. Campbell.

Section IV.h
Committees Reporting To Unit
Each unit includes in the annual plan and report a list of the committees whose work impacts that unit or any other aspect of the university; along with the list will be a notation documenting the repository location of the committee files and records. Committee actions affecting the unit's goals may be noted in other applicable sections of the annual reports. Not required to be included in the unit's annual plan and report, but required to be maintained in the repository location, will be a committee file that includes, for each committee: Mission and by-laws, Membership, Process, Minutes.
Narrative
The minutes for all committee meetings are maintained at the present time in the Division of Biological and Physical Sciences division office in Walters 180, unless otherwise specified. Upon completion of faculty searches, most search committee meeting minutes are turned over to the Human Resources office. Committee memberships are automatic in some cases (*e.g.*, all biology faculty members are on the Biology & Environmental Sciences Curriculum Committee); other committee assignments are made through a combination of faculty interests and division chair's decision.

Biology & Environmental Sciences Curriculum Committee
Chair of the Committee is Nina Baghai-Riding; Members of the Committee during AY 2012-2013 included A.H.N. Ali Reza, Eric Blackwell, Lacey Fitts, Severine Groh, Ellen Green, Jira Katembe, Tanya McKinney, John Tiftickjian, Yongqin Zhang.

Physical Sciences Curriculum Committee
Chair of the Committee is Alline Somlai; Members of the Committee during AY 2012-2013 included Joseph Bentley, Arthur Chu, Jill Harper, Lacey Fitts, Alina Gabryszewska-Kukawa, Carlysle Meek, Chuck Smithhart.

Division of Biological & Physical Sciences Tenure & Promotions Committee
Chair of the Committee is Joseph Bentley; Members of the Committee during AY 2012-2013 included Nina Baghai-Riding, Eric Blackwell, Alina Gabryszewska-Kukawa, Ellen Green, Jira Katembe, Tanya McKinney, Carlysle Meek, Chuck Smithhart, Alline Somlai, John Tiftickjian.

Safety and Security Committee
Chair of the Committee is Eric Blackwell; Members of the Committee for AY 2012-2013 included Chuck Smithhart, Nina Baghai-Riding, Alina Gabryszewska-Kukawa, John Tiftickjian.

Student Recruitment & Retention Committee
Chair of the Committee is Tanya McKinney; Members of the Committee during AY 2012-2013 included Ellen Green, Alline Somlai, and A.H.M. Ali Reza.

Academic Awards and Scholarships Committee
Chair of the Committee is Carlysle Meek; Members of the Committee duing AY 2012-2013 included Ellen Green, Eric Blackwell, and Tanya McKinney.

Merit Pay Policy Committee
Chair of the Committee is Eric Blackwell; Members of the Committee during AY 2012-2013 included Jill Harper, John Tiftickjian, Ellen Green, and Chuck Smithhart.

Instructional Technology Committee
Chair of the Committee is John Tiftickjian; Members of the Committee during AY 2012-2013 included Alina Gabryszewska-Kukawa, Jira Katembe, and Carlysle Meek.

During AY 2012-2013, a **Biochemist Search Committee** was formed to find a qualified person to fill the biochemistry position in the division. Dr. Joseph Bentley was designated as the chair of this search committee. Some of the early records of the activities of this committee were moved to Human Resources in Kent Wyatt Hall, as required by the university's policies.

Section V.a
Faculty (Accomplishments)
Noteworthy activities and accomplishments
Narrative
Scholarly Presentations

Baghai-Riding, N., Hotton, C., Davidson, T., Baria, L. R., Niemeyer, P. 2012. Marine and terrestrial palynomorphs from the Late Jurassic Smackover Formation, South Central Alabama, U.S.A. Botanical Society of America Conference.
(http://2012.botanyconference.org/engine/search/index.php?func=detail&aid=554)

Baghai-Riding, N., Hotton, C., Davidson, T., Baria, L. R., Niemeyer, P. 2012, Palynomorphs from the Jurassic Smackover Formation, Conecun Embayment Alabama, U.S.A.: Implications for paleoclimate, tectonics, and basinal history; Geological Society of America National Meeting (abstract #211605).

Cupil, A.L. III, Griffith, C., Horne, B. L. Jr., Williams, C., McGee, J. Sr., Kilpatrick, J., Wahidi, M., Collins, J., D,. Jr., **Baghai-Riding, N.** 2012, Indurated, iron-rich layers related to microbes in central Mississippi sandstone; Geological Society of America National Meeting (abstract 204452).

Baghai-Riding, N., Bise, R. D., Kazal, E. A., Collins, J. D. Jr., Kirkland, B. L., Merritt, D. N., Moody, H. A., Roberts, W. G. Jr. and Shows, K. J. 2012, Possible microbial influence on dissolution of pyrite in Demopolis Chalk NE, Mississippi; Geological Society of America National Meeting (abstract 204454).
Kirkland, B. L. Lindsey, C., Woodard, C., Simmons, J., Jasper, G., Collins, J. D.. Jr., **Baghai-Riding, N. L**., Tisdale, R., and Grant, G., 2012, Enhanced microbial precipitation of iron oxides in Demopolis Calk Formations. Geological Society of America National Meeting (abstract 204453).

Chase Hall, Frank Smith, **A.H.M. Reza**, and **Eric Blackwell**. A Preliminary Report on Managing Feral Hogs (*Sus scrofa*) in Dahomey National Wildlife Refuge. 77th Annual Meeting, MS Academy of Science. Hattiesburg, MS. 21 Feb.

Somlai, A.P. Implementation of Stereochemistry Podcast Video Tutorials using Models 360 (Chemical Education Digital Library). 2012 Biennial Conference on Chemical Education. College Station, Pennsylvania. July 29-August 2, 2012. Invited Talk.

Publications

Note: In AY 2012-2013, Dr. Eric Blackwell was notified that the paper submitted by himself and DSU biology student Justin Johnson in 2011, Population Dynamics of Two Aquatic Salamanders, *Siren intermedia* and *Amphiuma tridactylum* in the Mississippi Delta. BIOS 82(3):72-77, had been named a McClung Award winner, given to the best paper published in the journal BIOS for the entire year.

Section V.e
Recommended Change(s) of Status
Narrative
Faculty Promotions/Change in Status
Dr. Arthur Chu completed his one-year terminal contract in May, 2013. A search was initiated for a new biochemistry professor.

Dr. Severine Groh assumed her duties as the division's new assistant professor in anatomy & physiology in August, 2012.

Big Ideas and Anchoring Concepts provided by *J. Chem. Educ.* 2012, 89, 715-720.

ACS Examination Institute Organic Chemistry 1994

Atoms: Matter consists of atoms that have internal structures that dictate their chemical and physical behavior.

2, 4, 9

Questions	Pre-test 2011/15*	Post-test 2011/16	Pre-test 2012/18	Post-test 2012/16
2	10	12	12	11
4	1	7	7	8
9	9	7	10	9

The table records the number of correct responses.

*Number of students taking the pre-test or post-test.

Bonding: Atoms interact via electrostatic forces to form chemical bonds.

1, 5, 6

Questions	Pre-test 2011/15	Post-test 2011/16	Pre-test 2012/18	Post-test 2012/16
1	5	7	7	8
5	5	4	8	6
6	8	10	10	7

The table records the number of correct responses.

Structure & Function: Chemical compounds have geometric structures that influence their chemical and physical behaviors.

14, 20

Questions	Pre-test 2011/15	Post-test 2011/16	Pre-test 2012/18	Post-test 2012/16
14	6	8	7	7
20	6	14	10	12

The table records the number of correct responses.

Intermolecular Interactions: Intermolecular forces- electrostatic forces between molecules dictate the physical behavior of matter.

11

Question	Pre-test 2011/15	Post-test 2011/16	Pre-test 2012/18	Post-test 2012/16
11	6	7	10	7

The table records the number of correct responses.

Chemical Reactions: Matter changes, forming products that have new chemical and physical properties.

10, 22, 24, 25, 28, 29, 30, 31, 32, 34, 36, 37, 38, 41, 42, 43, 44, 48, 49, 51, 52, 53, 56, 57, 64, 68.

Questions	Pre-test 2011/15	Post-test 2011/16	Pre-test 2012/18	Post-test 2012/16
10	4	8	2	7
22	7	7	3	6
24	9	13	14	12
25	5	11	4	10
28	5	8	5	3
29	3	4	7	3
30	3	4	5	7
31	6	4	4	7
32	2	2	5	1
34	4	10	5	13
36	5	13	8	13
37	5	12	5	10
38	6	13	7	10
41	3	8	4	4
42	6	11	4	9
43	3	8	4	13
44	2	10	4	10
48	4	4	5	9
49	7	10	10	9
51	3	10	5	6
52	8	12	4	5
53	0	6	0	4
56	5	8	5	7
57	3	6	3	4
64	4	10	5	
68	2	1	3	

Energy and Thermodynamics: Energy is the key currency of chemical reactions in molecular-scale systems as well as macroscopic systems.

8

Question	Pre-test 2011/15	Post-test 2011/16	Pre-test 2012/18	Post-test 2012/16
8	2	10	1	10

Kinetics: Chemical Changes have a time scale over which they occur.

Equilibrium: All chemical changes are, in principle, reversible; chemical processes often reach a state of dynamic equilibrium.

12

Question	Pre-test 2011/15	Post-test 2011/16	Pre-test 2012/18	Post-test 2012/16
12	6	13	6	13

Experiments, Measurements and Data: Chemistry is generally advanced via experimental observation.

7

Question	Pre-test 2011/15	Post-test 2011/16	Pre-test 2012/18	Post-test 2012/16
7	3	4	2	4

Visualization: Chemistry constructs meaning interchangeably at the particulate and macroscopic levels.

15, 19, 58, 60, 70.

Questions	Pre-test 2011/15	Post-test 2011/	Pre-test 2012/18	Post-test 2012/16
15	8	12	13	13
19	4	5	3	3
58	1	10	4	3
60	5	6	4	4
70	7	7	4	6

The 1994 ACS Organic Chemistry Final is a two hour comprehensive examination, covering material from two semesters of Organic Chemistry.

Mean + SD	Pre-test 2011/15	Post-test 2011/	Pre-test 2012/18	Post-test 2012/16
38.92+11.22/70 questions	19.8/70 questions	31.5/70 questions	22/ 70 questions	30.8/70 questions

The table below contains the top scores for the past two years. The mean number of correct questions is 38.92 has a percentile value between 49 percentile (38 questions correct) and 53 percentile (49 questions correct.)

Post-test 2011	Post-test 2012
47/70 75 percentile	43/70 62 percentile
42/70 62 percentile	42/70 62 percentile
40/70 56 percentile	38/70 49 percentile
54/70 89 percentile	36/70 43 percentile (three students)

Credit Hour Production							
	Summer		*Fall*		*Spring*		
	UG	*GR*	*UG*	*GR*	*UG*	*GR*	*Total*
Biology							
AY 2013	**192**	**9**	**2494**	**71**	**1938**	**60**	**4764**
AY 2012	**238**	**0**	**2,214**	**20**	**1,968**	**23**	**4463**
AY 2011	**227**	**0**	**2345**	**6**	**1966**	**4**	**4548**
AY 2010	**329**	**4**	**2,173**	**22**	**2,097**	**6**	**4631**
AY 2009	**312**	**16**	**2,361**	**4**	**2,218**	**0**	**4911**
Chemistry							
AY 2013	**157**	**6**	**889**	**7**	**825**	**15**	**1899**
AY 2012	**122**	**0**	**860**	**15**	**732**	**17**	**1746**
AY 2011	**132**	**0**	**779**	**11**	**663**	**15**	**1600**
AY 2010	**291**	**3**	**922**	**6**	**737**	**22**	**1981**
AY 2009	**152**	**4**	**1,031**	**0**	**821**	**0**	**2008**
Physical Science							
AY 2013	**200**	**0**	**559**	**0**	**670**	**0**	**1429**
AY 2012	**243**	**0**	**569**	**0**	**624**	**3**	**1439**
AY 2011	**297**	**0**	**711**	**0**	**627**	**0**	**1635**
AY 2010	**223**	**0**	**755**	**0**	**632**	**0**	**1610**
AY 2009	**221**	**0**	**620**	**0**	**583**	**0**	**1424**
AY Totals							
AY 2013	**549**	**15**	**3942**	**78**	**3433**	**75**	**8092**
AY 2012	**603**	**0**	**3643**	**35**	**3324**	**43**	**7648**
AY 2011	**656**	**0**	**3835**	**17**	**3256**	**19**	**7783**
AY 2010	**843**	**7**	**3850**	**28**	**3466**	**28**	**8222**
AY 2009	**685**	**20**	**4012**	**4**	**3622**	**0**	**8343**

Enrollment by Major						
	Summer		*Fall*		*Spring*	
	UG	*GR*	*UG*	*GR*	*UG*	*GR*
Biology						
AY 2013	68	0	237	0	185	0
AY 2012	64	0	233	0	194	0
AY 2011	79	0	206	0	181	0
AY 2010	79	0	248	0	211	0
AY 2009	58	0	188	0	173	0
Chemistry						
AY 2013	14	0	38	0	34	0
AY 2012	7	0	38	0	30	0
AY 2011	11	0	44	0	44	0
AY 2010	26	0	42	0	37	0
AY 2009	16	0	59	0	41	0
Environmental Science						
AY 2013	6	0	28	0	23	0
AY 2012	9	0	23	0	22	0
AY 2011	6	0	22	0	20	0
AY 2010	2	0	23	0	17	0
AY 2009	5	0	20	0	17	0
Natural Science						
AY 2013	0	3	0	8	0	6
AY 2012	0	2	0	7	0	6
AY 2011	0	0	0	3	0	3
AY 2010	0	0	0	3	0	3
AY 2009	0	3	0	2	0	1
AY Totals						
AY 2013	20	3	66	8	57	6
AY 2012	16	2	61	7	52	6
AY 2011	17	0	66	3	64	3
AY 2010	28	0	65	3	54	3
AY 2009	21	3	79	2	58	1

Graduates					
	Biology	*Chem*	*Env Sci*	*Nat Sci*	
	BS	*BS*	*BS*	*MSNS*	Total
AY 2013	39	6	4	3	52
AY 2012	19	10	5	2	36
AY 2011	34	9	3	0	46
AY 2010	33	8	2	0	43
AY 2009	25	9	7	2	43