



Sam Houston
State University

2013-2014

College of Sciences

**Department of Agriculture
and Industrial Sciences**



Online Assessment Tracking Database

Sam Houston State University (SHSU)
2013 - 2014

Agriculture BS (Agricultural Business)

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Goal Knowledge Of Key Concepts And Skills

Students will develop knowledge and skills relevant to agriculture business.

Objective (L) Development Of Students' Knowledge And Skills

Students will be able to demonstrate competency in key areas of agricultural business including strategic management and an analysis of an existing company to include financial and strategic analysis.

Indicator AGRI 4375 Agribusiness Capstone

All students enrolled in the agribusiness program must complete AGRI 4375 in their senior year. AGRI 4375 addresses key concepts and skills relevant to the field of agribusiness and strategic management. Five randomly selected student assignments from AGRI 4375 will be reviewed by faculty members with expertise in the field of agribusiness. Faculty members will score the assignments using a scale of 1 - 5 with 3 "meets expectations," 4 "exceeds expectations," and 5 "far exceeds expectations."

Criterion At Least 70% Rated As Meeting Expectations

It will be a general agreement from Agribusiness faculty that at least 70% of the students enrolled AGRI 4375 will perform at a level of 3 (meets expectations" or higher on the assessed assignments, especially in the area of grammar, a specific weakness that was identified in previous assessment periods.

Finding Agribusiness Knowledge And Application

Assessed assignments did not meet the 70% and 3.0 expectations set by the faculty. Most shortfalls were in 2 areas of the rubric: technical writing skills with a 1.5 score and financial analysis. Several of the assessed documents failed to include the analysis in their report thus pulling the group average below expectations. However, the strengths in knowledge of agribusiness concepts and critical thinking were strengths.

Action Program Review

Agribusiness will continue to emphasis writing skills and technical writing activities across the ag business curriculum. To try to improve these outcomes faculty will utilize the writing center and require students to document at least 2 visits. Financial analysis will be emphasized more in the class and stress its inclusion in the final documents.

Goal Develop Professional Skills

Students will learn the skills necessary to compete in the professional marketplace.

Objective (L) Development Of Marketplace Skills

Students completing the BS in Agricultural Business will

demonstrate skills necessary to compete in the professional marketplace.

Indicator

AGRI 4120 Assignment Rubric  

All students seeking a degree in Agribusiness will be required to complete AGRI 4120 during their senior year. The course addresses essential skills necessary to compete in the market place for agriculture employment - resume preparation, interview skills, and employment opportunities. Faculty will review student assignments and assess student performance on selected assignments using a faculty-developed rubric.

Criterion

70% Of Students To Meet Professional Expectations 

Faculty evaluations will indicate that at least 70% of the Ag Business students enrolled in AGRI 4120 will perform at an acceptable level and score a 3 (meets expectations) or higher on a scale of 1-5. Clarity and grammar were concerns from previous years and continue to areas to address.

Finding

Professional Development 

The goal was achieved with an average score of 3.8 from the 5 portfolios assessed. Resumes were professional and exceed expectations. The grammar and writing skills on cover letters and documents were well organized and concise. Short falls was aligning cover letter and resume together. Overall, professional skills of agribusiness students were achieved.

Action

Professionalism Review 

Faculty will continue with the writing emphasis but spend more time emphasizing the importance of cover letter and resume alignment.

Previous Cycle's "Plan for Continuous Improvement"

Faculty will emphasize professional writing skills in lower level courses to enhance their writing skills. Organization, grammar and wordiness will be emphasized across the discipline. Curriculum in AgBusiness is continually be reviewed.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

Agribusiness faculty are continuing to review curriculum and determine assessment outcomes. 2 new faculty will join the team in fall 2014 and add to the dynamics of the program.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

Though professional writing has achieved acceptable levels, technical writing still failed to meet the expectations. Faculty will continue to emphasis writing across the curriculum and use of the writing center.

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Online Assessment Tracking Database


Sam Houston State University (SHSU)
2013 - 2014

Agriculture BS (Animal Science)



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Goal **Knowledge Of Key Concepts And Skills** 


Students will develop knowledge and understanding of key concepts and skills relevant to Animal Science.

Objective (L) **Development Of Students' Knowledge And Skills** 


Students will be able to demonstrate competency in key areas of animal science.

Indicator **Advanced Animal Production Assignment Rubric**  


All students enrolled in the program must complete an advanced animal science course. The course for assessment (AGRI 3373) addresses key concepts relevant to the field of animal science and knowledge expected for animal science graduates. During the fall semester, 15 randomly selected student assignments will be reviewed by animal science faculty members. Faculty members will score the assignments using a scale of 1 - 5 with 3 "meets expectations," 4 "exceeds expectations," and 5 "far exceeds expectations."

Criterion **At Least 70% To Be Rated As Meeting Expectations** 

There will be a general consensus among Animal Science Faculty members that at least 70% of the students enrolled in the advanced course will perform at an acceptable level with a score of 3 (meets expectations) or higher, especially in the areas of scientific knowledge, application of knowledge, and grammar. Weaknesses continue to be observed in grammar, organization of thought and clarity. Although we averaged a 4.1 last year, and average includes those below that point although they still might "meet expectations." Thus, the standard will remain at 3 (meets expectations) for this assessment period.

Finding **Animal Science Knowledge And Application** 


Overall, 66% of the students achieved an overall score of 3.0 (met expectations) from the rubric with the average score of 3.5. The low percentage achieving expectations was evident do to the number of assessed documents that lacked scientific knowledge and unable to document application of knowledge, average score of 2.9 and 2.6, respectively. However, an improvement over other assessment periods was high scores in grammar and clarity with average scores of 4.4 and 3.6, respectively, were achieved.

Action **Knowledge And Application** 



Assessed student documents demonstrated an improvement in grammar and clarity of writing. This improvement can be attributed to an increased objective of writing activity across the animal science curriculum that has been initiated in freshman courses. Though, scientific knowledge was slightly shy of expectations the course will address alternative methods (outlines of lectures, course packets, etc.) of providing the scientific information to students. Providing lecture outlines will allow the student to listen more closely to faculty explanations of concepts. This should allow the student to improve their assimilation of the knowledge and improve their application of the knowledge.

Goal **Develop Professional Skills** 


Students will learn the skills necessary to compete in the professional marketplace.

Objective (L) **Development Of Marketplace Skills** 


Students completing the BS in Animal Science will demonstrate skills necessary to compete in the professional marketplace.

Indicator **AGRI 4120 Assignment Rubric**  


All students seeking a degree in Animal Science will be required to complete AGRI 4120 during their senior year. The course addresses essential skills necessary to compete in the market place for agriculture employment - resume preparation, interview skills, and employment opportunities. Faculty will review student assignments and assess student performance on selected assignments using a faculty-developed rubric.

Criterion **70% Of Students To Meet Professional Expectations** 

Faculty evaluations are expected to indicate that at least 70% of the animal science students enrolled in AGRI 4120 will perform at an acceptable level and score a 3 (meets expectations) or higher on a scale of 1-5. Organization, grammar and content were identified as areas needing improvement from 2012-2013 assessment. We averaged 4.1 last year and will up the expectation to from 3.0 to 3.5 for this assessment period.

Finding **Professional Skills** 

The average score from the assessment was 3.2. Strengths were: quality in resumes and well organized, cover letters we acceptable with some attention need to grammar. Weaknesses were following instructions on reference pages and letters of references. Evaluators are satisfied with the student outcomes thought the average score is below the expected goal. The shortfalls were minor in the scheme of professional resumes writing, etc. Instructor will spend more time on explaining importance of reference pages and alignment in subsequent assessment periods.

Action **Professionalism** 

Though the actual score was not met the professional writing skills and organizational outcomes were met from the evaluated documents. The shortfalls were noted and more detailed explanations will be provided.

Previous Cycle's "Plan for Continuous Improvement"

Faculty will emphasize professional writing skills and Math in lower level courses to enhance their writing and STEM attributes. Organization of thoughts on paper is difficult for some students and math is a challenge.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

Writing skills and grammar have shown improvements from past assessment periods, these improvements are

believed to be attributed to the across curriculum writing emphasis.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

Emphasis will continue on professional writing and concise writing skills. Lecture outlines and lecture modifications will be incorporated in the classroom to improve student scientific knowledge and application of such knowledge.

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**Department of Agriculture
and Industrial Sciences**






Online Assessment Tracking Database


Sam Houston State University (SHSU)
2013 - 2014


Industrial Technology BS


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Goal **Develop Knowledge And Safety Skills**  
 Students will develop knowledge and safety skills relevant to Industrial Technology.

Objective (L) **Development Of Students' Knowledge And Skills** 
 Students will be able to demonstrate competency in key areas of industrial technology by passing the OSHA Safety Course and receive OSHA Certification. The OSHA Certification serves as a capstone requirement. The test is administered by an outside agency.


Indicator **ITEC 4382 OSHA Certification** 
 All students enrolled in the program must complete ITEC 4382 and receive their OSHA Certification in Safety. The course addresses key concepts and skills relevant to safety in the field of Industrial Technology. Each semester all students are required to take the OSHA Certification examination as the capstone activity for the course. The certification exam is divided into multiple sections, however, an overall passing grade of 70% or higher is passing.



Criterion **100% Certification Rate** 
 There is a consensus that at least 80% of the students taking the OSHA examination will make a 90 or higher on the exam, while, 100% will be certified by making a score of 70 or higher.

Finding **Certification** 
 All students that took the OSHA certification exam passed the exam with a 70 or higher. However, the average score was 88.7 falling short of the goal of a 90. Fall Hazards and Health Hazards in construction zones were the areas with the poorest performance from students

Action **Component Improvement** 
 More time and simulations will be used to increase student performance in Health and Fall Hazards in construction areas.

Goal **Develop Professional Skills** 
 Students will learn the skills necessary to compete in the professional marketplace.

Objective (L) **Demonstrate Professional Skills** 
 Students completing the BS in Instructional Technology will demonstrate skills necessary to compete in the professional marketplace through an internship.

Indicator **ITEC 4391 Internship Evaluation**  
 All students enrolled in the program must complete ITEC 4391 in their final

year of enrollment. ITEC 4391 addresses key concepts and skills, as well as practical demonstrations of competency relevant to the field of industrial technology. Each semester interns will be evaluated by their internship supervisor and by their faculty supervisor on a faculty-developed rating scale.

Criterion

85% Meeting Expectations 🔑

There will be a general consensus among I T Faculty members who review both university and internship supervisor assessments that at least 85% of the students enrolled in ITEC 4391 demonstrated an above average (4.0 or higher) level of performance on the rating scales.

Finding

Intenrship Performance 🔑

All Students successfully complete their internship with assessed skill level from their supervisor of 4 or 5. According to supervisor, the interns were professional with exceptional work ethics. Skill levels met the expectations of the job requirement. Safety management was an area that a few supervisors would like to see expanded in the curriculum.

Action

Program Review Of Outcomes 🔑

The program exceeded goal of 4.0, however, safety management will be reviewed in curriculum to determine potential areas of inclusion.

Previous Cycle's "Plan for Continuous Improvement"

Faculty will continue to review curriculum to ensure it provides skill sets requested by employers and the industry. Continue to review software for CAD courses and drafting skills.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

With new faculty and curriculum review, safety was determined to be essential and assessment was redirected.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

More time and simulations will be used to increase student performance in Health and Fall Hazards in construction areas.

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Online Assessment Tracking Database

Sam Houston State University (SHSU)
2013 - 2014

Industrial Technology BS (Design And Development)

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Goal	Develop Knowledge And Skills 🔑 Students will develop knowledge and skills relevant to Design and Development.
Objective (L)	Development Of Students' Knowledge And Skill 🔑 Students will be required to demonstrate competency in key areas of Design and Development.
Indicator	ITEC 4339 Design And Development Course Rubric 🔑 🔑 All students enrolled in the program are required to complete ITEC 4339 and successfully demonstrate use of resources and demonstrate acceptable designing skills. Each semester seven randomly selected student assignments will be reviewed by faculty members with expertise in the field. Faculty members will score the assignments using a scale of 1 - 5 with 3 "meets expectations," 4 "exceeds expectations," and 5 "far exceeds expectations."
Criterion	At Least 70% Meeting Expectations 🔑 There will be a general consensus among I T Faculty members that at least 70% of the students enrolled in ITEC 4339 will perform at an acceptable level with a score of 3.5 (meets standards) or higher.
Finding	Assessment Of Skill Base 🔑 On average the students scored 4.02, however, some weaknesses became apparent. Students scored low on Knowledge of free hand sketching and communication with others.
Action	Improvements 🔑 Engineering graphics will be emphasized in freshman and sophomore courses along with basic drafting to improve free hand sketching. Transfer students seemed to not have required skill set, more time on dimensioning and prototyping by instructor.

Goal	Develop Professional Skills 🔑 Students will learn the skills necessary to compete in the professional marketplace.
Objective (L)	Demonstrate Professional Skills 🔑 Students completing the BS in Design and Development (D&D) will demonstrate skills necessary to compete in the professional marketplace through an internship.
Indicator	ITED 4391 Internship Evaluation 🔑 🔑 All students enrolled in the program must complete ITED 4391 in their final year of enrollment. ITEC 4391 addresses key concepts and skills relevant to the field of design. Each semester interns will be evaluated by their internship supervisor and by their faculty supervisor on a faculty-developed rating scale.
Criterion	80% Meeting Expectations 🔑

There will be a general consensus among ITEC Faculty members who review both university and internship supervisor assessments that at least 80% of the students enrolled in ITED 4391 demonstrated an above average level of performance on the rating scales.

Finding

Internship Experience

Internships with students from this program have been small in number, therefore their reviews are combined with the construction assessments. All have received positive review from supervisors and visiting faculty for professional work skills and ethics. For those assessed the goal was met with a 4.0+ review. Critically, the student skills could be refined in drafting. These skills were noted in the capstone class ITEC 4339, as well.

Action

Skill Assessment

The program goal was achieved, however, refined skills will be addressed in the lower level courses.

Previous Cycle's "Plan for Continuous Improvement"

Expand internship opportunities for students with D&D skills and degree. Faculty will focus on outreach into this area. Students will be continue to required to demonstrate drafting skills, creativity, precision and accuracy of projects.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

Expanded career fair to include drafting companies.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

Develop a pretest so instructor and assimilate skill set of students at the onset of the course. Faculty will work independently on students with low skill sets to bring them to expectations. Work with curriculum committee for freshman and sophomore course to ensure skill sets are being developed for advanced courses.

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**Department of Biological
Sciences**



Online Assessment Tracking Database

Sam Houston State University (SHSU)
2013 - 2014

Biology BA/BS

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Goal	<p>Effectively Deliver A Core Curriculum 🔑</p> <p>Students will be presented well designed classes to facilitate mastering of the materials identified as a core foundation in biology – Botany, Zoology and Cell Biology</p>
Objective (L)	<p>Mastery Of Core Curriculum 🔑</p> <p>Students will demonstrate a mastery of the core fields in biology: Botany, Zoology, Cell Biology, Microbiology, Genetics, Ecology and Evolution.</p>
Indicator	<p>Assessment Exam For Core Classes 🔑</p> <p>All graduating seniors will take an exiting Biology Assessment Exam (BAE), written by the Biology Faculty. We will analyze the BAE scores from the following areas: botany, zoology, cell biology, microbiology, genetics, evolution & ecology to evaluate whether students have a significant level of understanding of each of these fields.</p>
Criterion	<p>BAE Analysis For Core Classes 🔑</p> <p>All Biology majors will be expected to score significantly better than a failing grade in all core areas: botany, zoology, cell biology, microbiology, genetics, evolution and ecology.</p>
Finding	<p>BAE Results For Core Classes 🔑 🔑</p> <p>Twenty-seven (41%) graduating seniors took the Biology Assessment Exam. On average, students scored significantly greater than a failing grade (based a chi-square test against randomized answer choices) in all core areas. (Fig. 1). In general, questions with a high level of difficulty usually had a high frequency of incorrect answers. Questions of intermediate or low difficulty had a range of few wrong answer choices or a high number of incorrect answer choices (Fig. 2).</p>
Action	<p>Administer Exit Exam 🔑 🔑</p> <p>All Graduating seniors will be contacted by email and asked to take a biology exit exam that will test their comprehension of material from the basic core classes in biological sciences</p>
Objective (L)	<p>Understanding The Scientific Method And Develop Critical Thinking 🔑</p> <p>Students will demonstrate an understanding of the general nature of scientific knowledge and how scientific knowledge is gained (the scientific method). They also will be able to critically evaluate scientific data to draw informed conclusions.</p>
Indicator	<p>BAE Analysis 🔑</p> <p>All graduating seniors will take the Biology Assessment Exam (BAE). We will use BAE exam scores from analytical questions to evaluate a student's understanding of the scientific method and critical thinking.</p>
Criterion	<p>BAE Analysis 🔑</p>

All Biology majors will be expected to score significantly better than failing on analytical questions related to the scientific method and critical thinking.

Finding

BAE Results For Scientific Method And Critical Thinking

We examined the number of questions missed for questions that required critical thinking and graphical interpretation. Both are seated within principles of the scientific method. We found a difference between questions requiring graphical interpretation; and questions not requiring interpretation of graphical data. Specifically, students missed more questions that required interpretation of graphs. We found no difference between questions requiring analytical calculation and those not requiring calculations. See Fig. 3 for Specifics.

There are no actions for this objective.

Previous Cycle's "Plan for Continuous Improvement"

We will develop a departmental assessment committee.

The goals of the committee this year will be:

1. establish sub committees within each core area.
2. review questions within each core area
3. balance the number of factual knowledge questions and critical thinking questions.
4. create a broader range of question difficulties that will aid in analysis.
5. plan a mechanism to increase test turnout.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

The Department of Biological Sciences continues to review and this assessment and improve upon the questions asked to identify weaknesses in instruction.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

The Department of Biological Sciences now has 2 years of assessment exam data. Based on this we will begin comparing the two years. We also will continue to review questions in core areas, expand upon the critical thinking component to the exam, and continue to promote the test to maximize turnout.

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Online Assessment Tracking Database

Sam Houston State University (SHSU)
2013 - 2014

Biology MS

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Goal	Increase Knowledge Of Profession 	
	Students will gain knowledge of the profession by gaining experience in presenting at scientific conferences and through publication.	
Objective (L)	Students Knowledge Of Publication Process 	
	Students will be evaluated on their knowledge about the publication process. A test that examines the students knowledge of the profession will be administered when the student enters graduate school. After they take a course on professional aspects of biology, they will retake the exam. Student progress will be evaluated to exam knowledge of the publication process, etc.	
Indicator	Exit Exam 	
	Students will take an exit exam that asks specific questions about the publication process.	
Criterion	Exit Exam - Publications 	
	Scores will be compared to entrance exam. An increase in knowledge about the publication process will be an indicator of success.	
Finding	Exit Exam Assessment 	
	We did not implement the exit exam during this review period. We changed graduate coordinators. With assistance of the new graduate coordinator, a graduate exit exam will be created for our MS students.	
Indicator	Publication Rate 	
	Each student's publication record will be tracked throughout the MS degree.	
Criterion	Publication Rate 	
	The number of papers published following the MS graduation will be compared to number published when admitted into the program. An increase in publications over this time will indicate the student has learned about the process through direct experience.	
Finding	Publication Rate Results 	
	We graduated 9 students during the 2013 review period. These students had a combined total of 2 publications when admitted into the program. The combined total of publications for these students following a successful MS thesis defense was 4. Therefore, 2 manuscripts were published by graduate students during this review period.	
Action	Exit Exam And Tracking 	
	Create an Exit Exam and track publication success of graduates.	

Previous Cycle's "Plan for Continuous Improvement"

We learned that collecting and databasing information is critical for tracking students and evaluating goals. Since various faculty direct graduate students in independent research labs a better mechanism for tracking MS success in publications is needed.

To address this, we will:

1. develop a committee to plan and implement a data collecting system
2. we will begin compiling data from previous years.
3. we will analyze change in MS success (publication) over time.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

Committee is now established with new coordinator.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

We will continue collecting data for graduate publication rates over time. We may reassess the importance (significance) of the publication rate variable for monitoring MS program success. Currently this parameter seems to provide little information since so few students actually publish during their program.

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Department of Chemistry



Online Assessment Tracking Database

Sam Houston State University (SHSU)
2013 - 2014

Chemistry BS

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Goal**Deliver A Curriculum Appropriate For Understanding Fundamentals Of Chemistry**

The curriculum will address the discipline specific knowledge dictated by professional societies and/or professionals in the workforce.

Objective (L)**Demonstrate Understanding Of Fundamentals**

Chemistry is an intensely sequential discipline. Students must master the material at an average level of understanding in the first semester course (general chemistry I) before they are allowed to attempt the second semester course (general chemistry II). The same is true for each of the first five semester courses in the sequence (general chemistry I, general chemistry II, organic chemistry I, organic chemistry II and physical chemistry I).

The fundamental concepts covered in general chemistry I and II include: uncertainty in measurement, dimensional analysis, atomic and electronic structure, ionic and molecular formulas, nomenclature, stoichiometry, thermochemistry, bonding theories, valence shell electron pair repulsion theory, properties of gases, intermolecular forces, properties of solutions, kinetics, equilibrium, acid-base chemistry, oxidation-reduction chemistry, chemical thermodynamics and electrochemistry.

Indicator**American Chemical Society (ACS) General Chemistry Test**

All chemistry majors will be invited to take a nationally standardized test over general chemistry (written by the American Chemical Society Division of Chemical Education Examinations Institute) near their completion of general chemistry II. In order to encourage participation, the highest individual score is guaranteed scholarship money for a future semester, and additional scholarship monies will be scaled to percentile performance on the examination.

Criterion**ACS General Chemistry Examination Score**

Sixty percent of chemistry majors are expected to score within one standard deviation of the mean or higher than one standard deviation above the mean on the ACS standardized general chemistry examination. The major weakness in 2010-2011 was the low number of majors who took the exam. We are working to motivate more students to take the exam.


Finding**ACS General Chemistry Result**


Of the 26 students that took the exam (74 were invited to do so), 17 (65%) scored within one standard deviation of the mean or higher on the ACS standardized general chemistry examination. The criterion was met and exceeded overall. For chemistry majors (excluding forensic chemistry majors), 8 students took the exam (20 were invited to do) and 5 of them (62.5%) scored within one standard deviation of the mean or higher. Thus the criterion was met for the chemistry majors. Overall, the participation rate for the academic year was $26/74 = 35\%$ (and $8/20 = 40\%$ for chemistry majors and $18/54 = 33\%$ for forensic chemistry majors). We need to keep working on ways to encourage and allow participation in this exam.

Action**Fundamental Knowledge**



We think sitting for the ACS General Chemistry exam for chemistry and forensic chemistry majors as they finish CHEM 1412 (General Chemistry II) is important. We think that the scholarship money is a good incentive. This year's participation rate of 35% is the highest so far, and is much better than last year's rate of 7%. Offering two opportunities to take the exam in the


spring led to a higher participation rate. We will offer the exam twice in the fall and spring next year.



Goal	Deliver A Curriculum Appropriate For Understanding Organic Chemistry 
	The curriculum will provide students with opportunities to develop the skills typically required of professionals in the area organic chemistry.


Objective (L)	Demonstrate Understanding Of Organic Chemistry 
	Organic chemistry is covered in the second year of a chemistry degree. It follows a year of general chemistry and precedes physical chemistry.

Students will demonstrate competent knowledge of the topics covered in organic chemistry I and II which include: hydrocarbons (alkanes, alkenes and alkynes), aromatic systems, functional group chemistry (including the chemistry of alkyl halides, ethers and various carbonyl compounds), stereochemistry, and carbohydrate chemistry.

Indicator	ACS Organic Chemistry Test  
	A nationally standardized test over organic chemistry (written by the American Chemical Society Division of Chemical Education Examinations Institute) will be given to all chemistry majors who take organic chemistry II at Sam Houston State University. This test is given as the final examination for the course.

Criterion	ACS Organic Chemistry Examination Score 
	Seventy-five percent of chemistry majors are expected to score within one standard deviation of the mean or higher than one standard deviation above the mean on the ACS standardized organic chemistry examination. We will closely follow the performance of forensic chemistry majors who scored slightly lower than chemistry majors in 2010-2011.

Finding	ACS Organic Chemistry Result  
	Fourteen chemistry majors and 22 forensic chemistry majors took the exam during the academic year. Eleven of the chemistry majors ($11/14 = 79\%$) and 13 of the forensic chemistry majors ($13/22 = 59\%$) scored within one standard deviation of the mean or higher on the ACS standardized organic chemistry examination. Overall, the rate was $24/36 = 67\%$. The criterion was not met overall for these students. However, it was met for the chemistry majors. Last year, one instructor was identified as being correlated with an increased number of low scores. That instructor did not teach CHEM 2325 (Organic Chemistry II) this year. Once again, when multiple sections of a course are offered (as they were during the spring semester), the section that filled the fastest had the lowest performance on this exam. Those students who did not meet the criterion will repeat CHEM 2325.

Action	Organic Chemistry 
	Once again, we have data for all of the sections of CHEM 2325 (organic chemistry II) that were taught, and the biggest correlation with low performance on the standardized exam is the section that fills most quickly when there are all multiple sections. This suggests that some degree of student self-selection--perhaps they are choosing instructors that they perceive to be "easiest" or perhaps it is a time of day issue. We will continue to monitor the situation. In the past year, all of the students who failed to meet the criterion repeated the course and subsequently met the criterion. We will continue to assess students' performance.

Goal	Deliver A Curriculum Appropriate For Understanding Instrumental Analytical Methods In Chemistry 🔑 The curriculum will provide students with opportunities to develop the skills typically required of professionals in the area of instrumental analytical methods in chemistry.
Objective (L)	Demonstrate Understanding Of Instrumental Analytical Methods In Chemistry 🔑 The modern analytical laboratory makes extensive use of electronic instrumentation for the analysis of chemical samples. Our Instrumental Analytical Chemistry course (CHEM 4440) is designed to introduce students to and have them learn the importance and use of spectrophotometric, chromatographic, and mass spectrometric analytical instrumental methods and computers in analytical laboratories. The course's laboratory component includes a focus on complex technical writing and use of the scientific literature. Students must master this material to meet the objective. Dr. Thomas Chasteen has been the instructor for all sections of CHEM 4440 for more than a decade.
Indicator	Examinations In Instrumental Analytical Chemistry 🔑 🔑 All students in Instrumental Analytical Chemistry (CHEM 4440) are required to master the electronic, sampling, schematic, and computational fundamentals of modern analytical instrumentation as evaluated by 80-minute written tests requiring essays, laboratory data evaluation, and calculator-based computation. There are three tests and a final examination in this course. The testing of this knowledge and its application is standardized within the department across all sections.
Criterion	80% Of Chemistry Majors Meeting Expectations 🔑 Eighty percent of chemistry majors are expected to score within one standard deviation of the mean or higher than one standard deviation above the mean on the four examinations in this class. We expect statistical variability from test to test and from year to year.
Finding	Performance On CHEM 4440 Exams 🔑 🔑 On the first exam, 31 of the 35 students (89%) scored within one standard deviation of the mean or higher. On the second exam, 30 of the 35 students (86%) scored within one standard deviation of the mean or higher. On the third exam, 29 of the 35 students (83%) scored within one standard deviation of the mean or higher. On the final exam, 32 of the 35 students (91%) scored within one standard deviation of the mean or higher. The criterion was met for each exam, and overall the criterion was met. Clearly intervention is not needed.
Action	Monitor Instrumental Analysis Performance 🔑 We will assess student performance in CHEM 4440 on an ongoing basis. Clearly we are seeing year to year variations in student performance, and this is to be expected. We raised the criterion from 75% to 80% last year and the students met the criterion on all but one exam. This year our students met the criterion on all of the exams. Since we know that there is year to year variation, we will check the appropriateness of the criterion next year and perhaps raise it for the 2015-2016 academic year.

Goal	Deliver A Curriculum Appropriate For Mastery Of Advanced Chemistry Topics 🔑
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The curriculum will provide students with opportunities to develop the skills typically required of professionals in the area of advanced chemistry topics.

Objective (L)**Demonstrate Mastery Of Advanced Topics In Chemistry** 🔑

The material learned by the third year in the chemistry curriculum is refined and supported theoretically in Physical Chemistry I (CHEM 4448). The successful student will demonstrate a mastery of the advanced topics presented in this course. These topics include quantum theory, wave functions, the dipole approximation, electronic configuration, molecular structure, molecular orbital diagrams, symmetry, group theory, and the application of these topics to X-ray, ultraviolet, visible, infrared, Raman, and magnetic resonance spectroscopy. All sections of CHEM 4448 have been taught by Dr. Darren Williams since his arrival at SHSU in 2004.

Indicator**CHM 4448 Final Examination** 🔑 🔑

CHEM 4448 is required of all chemistry majors. The final examination in Physical Chemistry I (CHEM 4448), written by Dr. Darren Williams, is recognized by the faculty of the Department of Chemistry as being comprehensive and covers all of the advanced topics listed in the objective statement. Dr. Williams is the sole instructor of CHEM 4448 at SHSU having taught all sections of CHEM 4448 since his arrival on campus in 2004. All students are required to complete the final examination. Examples of final exams are on file and secured within the Department of Chemistry and may be viewed by contacting Dr. Williams directly at williams@shsu.edu.

Criterion**75% Of Chemistry Majors Scoring At Least 60%** 🔑

Seventy-five percent of chemistry majors are expected to demonstrate a mastery of at least sixty percent of the material (score 60%) on the comprehensive final examination.

Finding**Physical Chemistry Final Exam Results** 🔑 🔑

Of the 40 students who took the final, 87% of them made at least 60% on the final exam. The criterion was met.

Action**Physical Chemistry Action** 🔑

The data for the past several years show some fluctuations on a year to year basis, but overall a passing rate of 86-88% on the final is typical. For this latest cohort of students, those students who scored less than 60% on the final exam exhibited extremely poor time management skills, which resulted in poor laboratory performance (since key sections of the report were often left blank), which in turn resulted in poor performance on the final exam. Remediation was attempted during the semester to address the issue, but the students refused to take advantage of the advice offered. These students will be repeating the course next fall (or they will have changed their majors), and the importance of time management will be stressed.

Goal**Deliver A Curriculum With Appropriate Written And Oral Communication Skills Developed** 🔑

The curriculum will provide opportunities for mastery of written and oral skills.

Objective (L)**Demonstrate Adequate Written And Oral Communication** 🔑

Students will demonstrate the ability to present to an audience of their peers a talk (seminar) based on their own research or research that has been reported in the scientific literature.

Indicator**Chemistry Seminar Presentation**  

All chemistry majors are required to take CHEM 4100 "Chemical Literature Seminar". Students typically do so in their senior year. One of the requirements of this course is giving an oral PowerPoint presentation over either their own research or research from the published chemical literature, to the other students in the class.

Criterion**Acceptable Peer-Review Rating**  

All chemistry majors are required to receive an acceptable peer-rating on a required research presentation. Within the course, each student evaluates all other student presentations. The rubric is the last page of the syllabus. Over the years, we have found that peers tended to rate presenters rather highly. We hope to see more helpful feedback after providing additional instruction in constructive feedback.

Finding**Seminar Presentation** 

Once again anonymous student evaluation forms were used in the fall of 2013 (20 students) and in the spring of 2014 (12 students) in an effort for substantially improve the depth and quality of student comments. The instructor's form evaluating the student is signed. Attendance was taken on a separate, passed-around sheet.

While the instructor had intended to devote additional class time to peer-evaluation and to providing examples of helpful feedback, he forgot to do so.

All of the students received an acceptable peer-rating on their presentation.

Action**Seminar Actions** 

Changes proposed for the next academic year will be more time added at the course onset discussing the comment critiquing process. More specifically, an example student comment sheet with example comments/critiques will be distributed to the students and discussed. The expected improvements from an increased focus on the critiquing process might be written student comments that are more in-depth, thorough, or comprehensive with concrete suggestions of how the talk could be improved.

Previous Cycle's "Plan for Continuous Improvement"

In order to gather more data we will offer the ACS exam over general chemistry at two different times in the fall semester. Depending upon these results, we may do the same in the spring semester.

In the area of organic chemistry, we will monitor student performance on the standardized final and check instructor correlations. It may be appropriate to shift instructors.

In the area of instrumental analysis, we will monitor student performance through another cycle and see if raising the criterion is appropriate.

We will continue to monitor student progress in physical chemistry.

For the seminar, sample critiques and comments will be presented to students in hopes that more informative comments can be elicited.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

We did not offer the ACS exam over general chemistry at two different times at the end of the fall semester (since there weren't very many qualified students), but we did offer the exam twice at the end of the spring semester.

This yielded an increased response rate.

It was convenient to shift one instructor this year, and the result was still that the fastest filling section had the lowest performance.

For instrumental analysis, the criterion was raised, and students met the new criterion.

For physical chemistry, it was obvious to the instructor that the students who did poorly had issues with time management, but did not take advantage of opportunities offered to them.

For the seminar, the instructor forgot to provide sample critiques and comments this time.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

We assess the same courses year after year for our B.S. programs because the courses, the material, and the requirements of the American Chemical Society do not change. This means that our plans from year to year end up being remarkably similar.

This past year we demonstrated that offering two opportunities for qualified students to take the ACS exam over general chemistry resulted in much higher participation rates, so we will offer the exam at two different times in the spring semester. Depending upon the number of qualified students, we may do the same in the fall semester.

In the area of organic chemistry, we will monitor student performance on the standardized final and check instructor and time correlations. It may be appropriate to shift instructors to specific time slots.

In the area of instrumental analysis, we will monitor student performance through another cycle and see if raising the criterion yet again is appropriate.

We will continue to monitor student progress in physical chemistry, and issues related to time management will be addressed from the beginning of the course.

For the seminar, sample critiques and comments will be presented to students in hopes that more informative comments can be elicited.

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Online Assessment Tracking Database

Sam Houston State University (SHSU)
2013 - 2014

Chemistry MS

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Goal	Develop Presentation Skills 	
	The ability to communicate research and knowledge are fundamental presentation skills in chemistry.	
Objective (L)	Demonstrate Presentation Skills 	
	Students completing CHEM 5100 will, at least once during their tenure as graduate students, demonstrate the ability to make a research presentation.	
Indicator	Acceptable Student Seminar Peer-Reviewed Presentation 	
	During their tenure as graduate students, all students will present at least one departmental seminar. The faculty, through the peer-review evaluation rubric, will determine the presentation's acceptability.	
Criterion	At Least One Seminar Presentation  	
	All graduate students in chemistry are required to take CHEM 5100 at least once during their tenure as graduate students. To pass CHEM 5100, students are required to receive an acceptable peer-rating on a required research presentation. Within the course, each student evaluates all other student presentations. The rubric is the last page of the syllabus.	
Finding	Seminar Credit 	
	<p>CHEM 5100 once again used anonymous student evaluation forms for the fall of 2013 (16 students) and again in the spring of 2014 (13 students) in an effort to make the students' peer comments more meaningful (the instructor's form is signed). Poor student comments have not been as much of a problem in this graduate seminar as for the undergraduate seminar (CHEM 4100).</p> <p>Student comments were variable during this period. This may, in part, be due to an increase in the number of new international students, and a decrease in the number of returning graduate students.</p> <p>The 16 students enrolled in the fall of 2013 included all but one of our graduate students. The 13 students enrolled in the spring of 2014 did not include all of our graduate students. The total number of chemistry graduate students in the spring was 18. The 16 students enrolled in the fall included 7 new graduate students (1 of these was a domestic student). The 5 students who did not enroll in the spring had already taken the seminar 3 times.</p>	
Action	Seminar Actions 	
	Changes proposed for the next academic year will be more documentation of the critiquing process. More specifically, an example student comment sheet with example comments/critiques will be distributed to the students and discussed. The expected improvements from an increased focus on the critiquing process might be written student comments that are more in-depth, thorough, or comprehensive with concrete suggestions of how the talk could be improved. This action had been planned for this past year, but it was not implemented.	

Goal	Deliver A Curriculum With Appropriate Discipline Specific Knowledge 
	The program will address the discipline specific knowledge dictated by professional

societies and/or professionals in the workforce.

Objective (L)	<p>Demonstrate Knowledge Of Advanced Topics In Polymer Chemistry 🔑</p> <p>Polymer chemistry is a multidisciplinary subfield of chemistry. This graduate level course is organic-chemistry-based although it includes aspects of analytical, biological, inorganic, materials and physical chemistry. The first half of the course involves polymer synthesis presented in lecture format and the second half was split equally between polymer characterization in lecture format and student presentations on an advanced topic related to polymer chemistry.</p>
Indicator	<p>Examination Of Student Understanding Of Advanced Topics In Polymer Chemistry 🔑</p> <p>All students in the class are evaluated by written examination. One exam in the course is based primarily on the key points from the student presentations on advanced topics.</p>
Criterion	<p>Advanced Topics Exam Performance 🔑</p> <p>All students will score above one standard deviation below the mean on the advanced topics exam.</p>
Finding	<p>CHEM 5385 Fall Semester 2013 🔑</p> <p>During the Fall 2013 semester, 88% of the students scored higher than one standard deviation below the mean.</p>
Action	<p>Add Peer Evaluations And Presentation Summaries 🔑</p> <p>The next time this course is offered, students will be required to evaluate and summarize the key points of their peers' advanced topic presentations. These evaluations and summaries will be posted anonymously for the whole class to view. In this way, the students will be more engaged in the presentations and the key points will be more apparent to all students.</p>
Objective (L)	<p>Demonstrate Knowledge Of The Electronic Structure Of Metal Complexes 🔑</p> <p>CHEM 5374 "Chemistry of Coordination Compounds" is a course about transition metal complexes. An understanding of the nature of the metal-ligand bond is essential for students to address the rest of the material in the course.</p>
Indicator	<p>Mastery Of The MO Diagram For Octahedral Metal Complexes 🔑</p> <p>Graduate students in this course will demonstrate their mastery of the sigma only molecular orbital energy diagram for an octahedral metal complex by constructing such a diagram on an examination given the group theory character tables and the appropriate symmetries of the ligand orbitals.</p>
Criterion	<p>Exam Performance In CHEM 5374 🔑</p> <p>Over 90% of the students will score over 3 on a 5 point scale on the question "Draw a full molecular orbital energy diagram for $M(NH_3)_6^{n+}$ where M^{n+} is a transition metal. The symmetries of the lone pairs of ammonia are a_{1g}, e_g, and t_{1u}."</p>
Finding	<p>CHEM 5374 Exam Results 🔑</p> <p>Thirteen students scored 5 on the question. Two scored 4 and one scored 2. Thus $15/16 = 94\%$ scored above a 3. The criterion was met.</p>

Action

Monitor Progress 🔑

The criterion was met and this material will be emphasized through the use of homework assignments on the construction of molecular orbital energy diagrams the next time the course is offered.

Objective (L)

Demonstrate Advanced Organic Chemistry Knowledge And Skills 🔑

Physical organic chemistry is a field of organic chemistry that looks at the physical aspects (heat, light, stereochemistry, bond strengths, acidity, etc.) of bond formation and bond cleavage. This field had its beginnings in the 1930s and is useful to chemists as we try to address problems important in health care, food chemistry, synthesis, photophysical processes, and biochemical research.

Indicator

Competence In Understanding Physical Organic Chemistry Through Structure-Reactivity Examples 🔑

All students in the class are given problem sets to strengthen their understanding of physical aspects of organic chemistry, and to become cognizant of common research approaches to this field through published material on the changes of reactivity with changes in experimental reaction conditions. Competence is demonstrated by correct assessment of 90% of the assigned problems.

Criterion

Applications Of Key Reaction Intermediates In Organic Chemistry 🔑

Exam scores will be used to assess student understanding of the fundamental concepts of the course. These are the experimental results upon changes in reaction conditions (heat, or light). Additional homework may be assigned to those students who show some deficiencies in certain areas. Arriving at the same conclusions of the questions as the authors of the homework assignments will be used to judge the assigned homework.

Finding

Observed Mastery Of Physical Aspects Of Organic Chemistry 🔑

During the Spring 2014 semester, all students showed a grasp and use of the fundamental concepts of this field as applied to approaches to determining mechanisms of organic reactions on assignments during the course. These were realized by changes in chemistry with respect to structure-reactivity phenomena.

Action

Student Presentations Of Experimental Approaches 🔑

During the next course offering, peer evaluations of student presentations will be used to address the understanding and dissemination of fundamental concepts common to this field.

Objective (L)

Demonstrate Understanding Of Drug Development And Drug Antagonism 🔑

The course discusses the development of biologically active molecules and antagonists, through the exploration of the state of the art in drug antidotal therapy that employs the addition of exogenous metabolizing enzymes to destroy toxic molecules (e.g. chemical warfare agents) in the body and discussion of drug development following the approach of "Molecules from the Research Labs to the Hands of Doctors to Treat Diseases and Chemical Intoxications."

Indicator

Examination Of Student Understanding Of Basic Elements Of Industrial Biochemistry 🔑

All students in the class are evaluated by a final written comprehensive examination.

Criterion

Comprehensive Final Exam Performance

Eighty percent of graduate students taking the final exam in the class will score within one standard deviation of the mean or higher on the comprehensive final test.

Finding

CHEM 5385 Results

During the spring 2014 semester, 18 students took the course (two were from the forensic science M.S. program and the rest were graduate students in chemistry). Ninety-four percent of the students (17 out of 18) met the criterion.

Action

Increased Emphasis On Problem Solving

The next time the course is offered, there will be an increased emphasis on complex problem solving of tasks related to the objective through the use of individual homework and group classroom assignments.

Previous Cycle's "Plan for Continuous Improvement"

For the seminar, sample critiques and comments will be provided at the beginning of the course.

The next time organometallic chemistry is offered, the instructor will provide refined guidelines for the powerpoint presentations.

The next time analytical spectroscopy is offered, examples of actual peer reviews will be provided.

The next time organic reaction methods is offered, the instructor will outline the requirements for the final examination at the beginning of the semester.

The next time advanced symmetry and spectroscopy is offered, a final modeling assignment will be created with a rubric that allows the students to evaluate the strengths and weaknesses of their model.

We will abandon "completion of master's thesis" as a learning objective next year.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

Regarding the seminar, the instructor forgot to provide sample critiques and comments.

For the four courses, they were not offered during the 2013-2014 year, so the changes could not be implemented this year, which is why the previous cycle's plan stated "the next time...is offered".

Completion of the thesis was removed as a learning objective.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

The master's program is different than our undergraduate programs in a variety of ways. Most importantly for assessment purposes, with the exception of our seminar class (CHEM 5100), graduate research (CHEM 6398) and thesis (CHEM 6099), our courses are not offered every year. They aren't necessarily offered every other year--the frequency varies based on the instructors other demands and the needs of the students in the program.

For the seminar, sample critiques and comments will be provided at the beginning of the course.

For the course on polymer chemistry, the next time the course is offered, the instructor will require students to evaluate and summarize their peers' presentations, and these will be shared anonymously to the whole class.

For CHEM 5374, the next time the course is offered, the instructor will emphasize how students should create a sigma only molecular orbital energy diagram for octahedral metal complexes through homework assignments.

For physical organic chemistry, the next time the course is offered, the instructor will require peer evaluation of student presentations.

For industrial biochemistry, the next time the course is offered, the instructor will increase the emphasis on complex problem solving through the use of individual homework and group classroom assignments.

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**Department of Geography
and Geology**




Online Assessment Tracking Database


Sam Houston State University (SHSU)
2013 - 2014

Geography BA


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Goal **Training Geographically Informed Students** 


Students completing core education in geography will be able to demonstrate foundational knowledge of geographic principles and concepts about the physical world.

Objective (L) **First-Year Foundational Geographical Principles And Concepts** 


Students completing core curriculum education in geography will be able to demonstrate foundational knowledge of geographic concepts and principles, including critical thinking.

Indicator **Comprehensive Final Exam** 


Common embedded questions on the comprehensive final exam will determine student knowledge regarding general geographic concepts.

Criterion **70% Accuracy** 


The average scores will be 70% correct on the general geographic concept questions embedded in the comprehensive exam.

Finding **Performance On General Geographic Concept Questions** 


Students enrolled in GEOG 1301 averaged 61% on a series of specific concept questions embedded in a comprehensive final exam. Students enrolled in GEOG 1321 averaged 74% on a separate, yet very similar, series of concept questions. Both scores were generally consistent with overall overages on the respective final exams. The scores among students enrolled in GEOG 1301 were slightly lower than those from the previous year, although the scores among those enrolled in GEOG 1321 definitely did improve.

Indicator **Comprehensive Final Exam - Geographic Principles Portion** 

The final faculty-developed comprehensive exam will indicate students' grasp of major geographic principles, including critical thinking.

Criterion **70% Principle Accuracy** 

The average score will be 70% correct of the major geographic principles and critical thinking items embedded on the comprehensive exam.

Finding **Performance On Questions Pertaining To Major Geographic Concepts And Critical Thinking** 

Students enrolled in GEOG 1301 averaged 64% on a series of questions focused on competency with major principles and critical thinking skills that were embedded in a comprehensive exam. Students enrolled in GEOG 1321 averaged 69% on a similar series of questions. Students enrolled in both courses consistently scored lower than expected on questions requiring the interpretation of graphs and charts, but scores for both courses did improve, particularly in the case of GEOG 1301. Students enrolled in GEOG 1301 averaged 59% on such questions, while students enrolled in GEOG 1321 averaged 63%. Students enrolled in both courses scored significantly lower than expected on questions requiring the interpretation of basic statistics. Students enrolled in GEOG 1301 averaged 54% on such questions, while those enrolled in GEOG 1321 averaged 55% on them.

Action**Improving Geographical Understanding Of Concepts And Principles** 

Students enrolled in GEOG 1321 continue to exhibit a satisfactory level of competency in regards to basic geographic concepts, while students enrolled in GEOG 1301 continue to exhibit degrees of competency slightly below that level. In both cases, students generally scored as high on questions pertaining to these concepts as they did on exams as a whole. Students also continue to score below satisfactory levels on questions focused upon major geographical concepts and critical thinking. However, such scores did increase for both sets of students, particularly for those students enrolled in GEOG 1301. Regardless of such improvement, there remains a continued need to enhance student knowledge of such concepts. As has been identified in the past, it remains vividly evident that the effectiveness of GEOG 1321, relative to GEOG 1301, in terms of fostering such knowledge is directly due to the smaller class sizes associated with this course. Moreover, students enrolled in GEOG 1301 (Weather & Climate) represent a cross-section of the university who are typically attempting to fulfill a science requirement. By comparison, at least some students enrolling in GEOG 1321 (People, Place & the Environment) probably do so because they possess at least some pre-existing interest in the course beforehand. With this in mind, we plan to continue to more strongly incorporate the teaching of major concepts and critical thinking skills in smaller lab sections of Weather & Climate. We will also continue to replicate methodologies found to be successful in GEOG 1321 in other geography courses, including Weather & Climate. It should be noted that considerable efforts to address major geographic concepts and critical thinking skills were implemented within these two courses while they were being redeveloped to comply with the new Core Curriculum, which will go into effect in Fall 2014.

Objective (L)**Demonstrate Knowledge Of Foundational Concepts Of Physical Geography** 

Students completing the core education in geography will demonstrate knowledge of physical geography including the world in spatial terms, places and regions, and physical systems.

Indicator**Physical Geography Concepts** 

Students will correctly answer the embedded questions on exams throughout the semester that address physical geography. The areas of emphasis include the world in spatial terms, places and regions, and physical systems.

Criterion**70% Accuracy On Physical Concepts** 

Students will score 70% correct on those questions pertaining to each of the three areas of emphasis concerning physical geographical concepts.

Finding**Student Results Concerning Physical Geography Concepts** 

Students enrolled in GEOG 1321 scored on average 70% on those questions pertaining to the world in spatial terms. This score is slightly lower than the score found the previous year, but still meets expectations. Students enrolled in GEOG 1301 scored on average 63% on questions assessing this concept. Students enrolled in GEOG 1321 scored on average 69% on questions pertaining to concepts of places and regions, a higher score than was found the previous year. Students enrolled in GEOG 1301 scored on average 60% on such questions, a lower score than was realized previously. In those two assessment areas, students generally performed as well as they did on exams as a whole. Students enrolled in GEOG 1321 scored 65% on questions pertaining to physical systems, while students enrolled in GEOG 1301 scored 64% on such questions. Both scores were slightly increased from that of the previous year.

Action**Improving Understanding Of Physical Concepts In Geography** 

While there remains considerable room for improvement in the delivery of basic

concepts of physical geography, scores for students enrolled in GEOG 1321 suggest improvement in terms of the delivery of this subject area - at least within this particular course. Scores for GEOG 1301, however, did decrease slightly. The lack of improvement within this course partially stems from the larger class sizes, but is almost certainly also due to the fact that this particular course has been designed to place direct attention on a narrow dimension of this broad subject area. The scores for questions assessing knowledge of "places and regions," while improving among students enrolled in GEOG 1321, still remain below the expected level. We have already begun assessing student outcomes in this subject area in two separate courses (GEOG 2355 & GEOG 2356) that focus directly on this topic, but results are not yet in a format that could be reported within this assessment cycle. Both of these courses were recently redesigned in order to comply with the new Core Curriculum and this process was done with the need to meet this goal in mind. In Spring 2014 a new Environmental Geography course was offered for the first time, a course that directly focuses on concepts of physical systems. Accordingly, we fully expect to offer a more thoroughly assessment of the programs success in meeting this goal by next year.

Goal	Demonstrate Knowledge Of Cultural Concepts In Geography 🔑
	Students completing the core courses required for a Geography degree will demonstrate knowledge of cultural geography including both human systems and the interaction between the environment and society.

Objective (L)	Demonstrate Knowledge Of Cultural Concepts In Geography 🔑
	Students completing the core courses required for a Geography degree will demonstrate knowledge of cultural geography including both human systems and the interaction between the environment and society.

Indicator	Cultural Geography Concepts 🔑
	Students will correctly answer the embedded questions on exams during the semester that address cultural geography. The areas of emphasis include human systems and the environment and society.

Criterion	70% Accuracy On Cultural Concepts 🔑
	Students will score 70% correct on those questions pertaining to each of the two areas of emphasis associated with cultural geography concepts.

Finding	Student Learning Outcomes Concerning Cultural Concepts 🔑
	Students enrolled in GEOG 3350 scored an average of 74% on a set of questions focused upon human systems. Students enrolled in GEOG 1321 scored an average of 67% on those same questions. Students enrolled in GEOG 3350 scored 65% on questions concerning the interaction of the environment and society, while students enrolled in GEOG 1321 scored an average of 62% on these questions.

Action	Improving Knowledge Of Cultural Aspects Of Geography 🔑
	Results of this assessment suggest that geography students continue to possess adequate knowledge of various aspects of cultural geography, particularly those enrolled in GEOG 3350. In previous assessments student scores for both relevant courses, GEOG 1321 & GEOG 3350, were aggregated. Upon recording and reporting the results from the two courses separately, it becomes apparent that students enrolled in GEOG 3350 do significantly better than students enrolled in GEOG 1321. This is largely the function of the fact that students enrolled in GEOG 3350 tend to be juniors and seniors, while GEOG 1321 generally enrolls far more newly incoming students, particularly

freshmen. Moreover, GEOG 3350 (Cultural Geography) directly focuses on the relevant subject matter. Students enrolled in these courses do less than than expected in terms of demonstrating satisfactory knowledge of interactions between the environment and society. Future assessments will present the results for students enrolled in a new course (GEOG 2301; Environmental Geography) offered for the first time in Spring 2014. Thus, we are confident we can convey a better idea of how well geography students are doing in this subject area during the next assessment cycle.

Previous Cycle's "Plan for Continuous Improvement"

Some of the program weaknesses identified by this assessment will be mitigated by the offering of a new course; Environmental Geography. This new course will directly focus upon material pertaining to the awareness of physical systems and the relationships between the environment and human society. The addition of new faculty member will also enable us to strengthen our concentration in Environmental Geography via the offering of new courses focused on this subject matter. Certain other learning gaps identified by the assessment may simply reflect weaknesses with the assessment itself. For example, we offer a few courses that focus on regional geography (World Regional Geography, Regional Geography of U.S. and Canada), that would naturally focus more directly on "places and regions" than would the courses incorporated in this assessment. In the future we will embed assessment questions within the comprehensive finals associated with these regional courses. The most critical weaknesses identified from this assessment remain in the areas of learning major geographic principles and critical thinking. The scores from students enrolled in one course (GEOG 1321) did improve for these areas, We plan to continue to experiment with ways to enhance critical thinking in both lab and lecture formats, and will make concerted efforts to incorporate assignments and methods found to be successful in GEOG 1321 at generating positive learning outcomes.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

Two of the courses - GEOG 1401 (formerly 1301) and GEOG 1321 - utilized for this assessment have been fully redeveloped so that they comply with the new core curriculum, which goes into effect in Fall 2014. During this process these courses were specifically restructured so that they would facilitate the exact learning outcomes reflected in the goals of this assessment, such as critical learning and awareness of major geographic principles. Two other courses (GEOG 2355 & 2356) were also redeveloped for the new core, both emphasizing the teaching of other recognized goals (ex. "places and regions"). These two courses were utilized for assessment for the first time this past spring, but results are not yet in a format that could be presented here. Given the restructuring of these courses to more directly serve the goals outlined on this assessment, analysis of student outcomes associated with future sections of these courses will be informative. A new Environmental Geography course was taught for the first time in Spring 2014, a course which focuses more directly on physical systems and human-environment interaction than any other course in our curriculum. These same two subject areas represent two identifiable weaknesses within our program. Given that this brand new course was offered by a new faculty member, it was not possible to generate results as of yet. We fully expect to have a better picture during the next assessment cycle of how well our program is serving this particular need.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

Many of the weaknesses identified by student outcomes from this assessment represent weaknesses that have also been recognized on previous assessments. To that effect, we have proactively redesigned some of our courses to better serve the need for enhanced critical critical thinking and to facilitate the learning of both basic and major geographical concepts. We have also attempted to replicate methodologies proven to be effective in some courses (GEOG 1321) so that they could be implemented in other courses. Some of these methodologies, when applicable, will be implemented in lab sections, so that we can take advantage of the intimacy of smaller class sizes. We plan to further improve upon this overall endeavor by incorporating the assessment of additional courses that better serve certain specific goals, such as sections of World Regional Geography and Environmental Geography. These courses should offer a better test of how well our students are learning "regions and places" and "physical systems," respectively. Perhaps the biggest change we have made involves our efforts to fix the identifiable need to enhance student understanding of basic statistical measures, a weakness reflected within this assessment. Based on these results, we have restructured our degree requirements so that all geography majors will be required to successfully complete a basic statistics course. In addition, we have also incorporated some elementary statistical procedures within one of our introductory geography courses (GEOG 1321). Finally, we plan to continue efforts at experimenting with different ways to enhance learning across our curriculum as a

means to generate positive learning outcomes.

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Online Assessment Tracking Database


Sam Houston State University (SHSU)
2013 - 2014

Geography BS


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Goal **Training Geographically Informed Students** 


Students completing core education in geography will be able to demonstrate foundational knowledge of geographic principles and concepts about the physical world.

Objective (L) **First-Year Foundational Geographical Principles And Concepts** 


Students completing core curriculum education in geography will be able to demonstrate foundational knowledge of geographic concepts and principles, including critical thinking.

Indicator **Comprehensive Final Exam** 


Common embedded questions on the comprehensive final exam will determine student knowledge regarding general geographic concepts.

Criterion **70% Accuracy** 


The average scores will be 70% correct on the general geographic concept questions embedded in the comprehensive exam.

Finding **Performance On General Geographic Concept Questions** 


Students enrolled in GEOG 1301 averaged 61% on a series of specific concept questions embedded in a comprehensive final exam. Students enrolled in GEOG 1321 averaged 74% on a separate, yet very similar, series of concept questions. Both scores were generally consistent with overall overages on the respective final exams. The scores among students enrolled in GEOG 1301 were slightly lower than those from the previous year, although the scores among those enrolled in GEOG 1321 definitely did improve.

Indicator **Comprehensive Final Exam - Geographic Principles Portion** 

The final faculty-developed comprehensive exam will indicate students' grasp of major geographic principles, including critical thinking.

Criterion **70% Principle Accuracy** 

The average score will be 70% correct of the major geographic principles and critical thinking items embedded on the comprehensive exam.

Finding **Performance On Questions Pertaining To Major Geographic Concepts And Critical Thinking** 

Students enrolled in GEOG 1301 averaged 64% on a series of questions focused on competency with major principles and critical thinking skills that were embedded in a comprehensive exam. Students enrolled in GEOG 1321 averaged 69% on a similar series of questions. Students enrolled in both courses consistently scored lower than expected on questions requiring the interpretation of graphs and charts, but scores for both courses did improve, particularly in the case of GEOG 1301. Students enrolled in GEOG 1301 averaged 59% on such questions, while students enrolled in GEOG 1321 averaged 63%. Students enrolled in both courses scored significantly lower than expected on questions requiring the interpretation of basic statistics. Students enrolled in GEOG 1301 averaged 54% on such questions, while those enrolled in GEOG 1321 averaged 55% on them.

Action

Improving Geographical Understanding Of Concepts And Principles

Students enrolled in GEOG 1321 continue to exhibit a satisfactory level of competency in regards to basic geographic concepts, while students enrolled in GEOG 1301 continue to exhibit degrees of competency slightly below that level. In both cases, students generally scored as high on questions pertaining to these concepts as they did on exams as a whole. Students also continue to score below satisfactory levels on questions focused upon major geographical concepts and critical thinking. However, such scores did increase for both sets of students, particularly for those students enrolled in GEOG 1301. Regardless of such improvement, there remains a continued need to enhance student knowledge of such concepts. As has been identified in the past, it remains vividly evident that the effectiveness of GEOG 1321, relative to GEOG 1301, in terms of fostering such knowledge is directly due to the smaller class sizes associated with this course. Moreover, students enrolled in GEOG 1301 (Weather & Climate) represent a cross-section of the university who are typically attempting to fulfill a science requirement. By comparison, at least some students enrolled in GEOG 1321 (People, Place & the Environment) probably do so because they possess some pre-existing interest in the course beforehand. With this in mind, we plan to continue to more strongly incorporate the teaching of major concepts and critical thinking skills in smaller lab sections of Weather & Climate. We will also continue to replicate methodologies found to be successful in GEOG 1321 in other geography courses, including Weather & Climate. It should be noted that considerable efforts to address major geographic concepts and critical thinking skills were implemented within these two courses while they were being redeveloped to comply with the new Core Curriculum, which will go into effect in Fall 2014.

Objective (L)

Demonstrate Knowledge Of Foundational Concepts Of Physical Geography

Students completing the core education in geography will demonstrate knowledge of physical geography including the world in spatial terms, places and regions, and physical systems.

Indicator

Physical Geography Concepts

Students will correctly answer the embedded questions on exams throughout the semester that address physical geography. The areas of emphasis include the world in spatial terms, places and regions, and physical systems.

Criterion

70% Accuracy On Physical Concepts

Students will score 70% correct on those questions pertaining to each of the three areas of emphasis concerning physical geographical concepts.

Finding

Student Results Concerning Physical Geography Concepts

Students enrolled in GEOG 1321 scored on average 70% on those questions pertaining to the world in spatial terms. This score is slightly lower than the score found the previous year, but still meets expectations. Students enrolled in GEOG 1301 scored on average 63% on questions assessing this concept. Students enrolled in GEOG 1321 scored on average 69% on questions pertaining to concepts of places and regions, a higher score than was found the previous year. Students enrolled in GEOG 1301 scored on average 60% on such questions, a lower score than was realized previously. In those two assessment areas, students generally performed as well as they did on exams as a whole. Students enrolled in GEOG 1321 scored 65% on questions pertaining to physical systems, while students enrolled in GEOG 1301 scored 64% on such questions. Both scores were slightly increased from that of the previous year.

Action

Improving Understanding Of Physical Concepts In Geography

While there remains considerable room for improvement in the delivery of basic

concepts of physical geography, scores for students enrolled in GEOG 1321 suggest that we are indeed improving in the teaching of this subject area - at least within this particular course. Scores for GEOG 1301, however, did decrease slightly. The lack of improvement within this course partially stems from the larger class sizes, but is almost certainly also due to the fact that this particular course has been designed to place direct attention on a narrow dimension of this broad subject area. The scores for questions assessing knowledge of "places and regions," while improving among students enrolled in GEOG 1321, still remain below the expected level. We have already begun assessing student outcomes in this subject area in two separate courses (GEOG 2355 & GEOG 2356) that focus directly on this topic, but results are not yet in a format that could be reported within this assessment cycle. Both of these courses were recently redesigned in order to comply with the new Core Curriculum and this process was done with the need to meet this goal in mind. In Spring 2014 a new Environmental Geography course was offered for the first time, a course that directly focuses on concepts of physical systems. Accordingly, we fully expect to offer a more thorough assessment of the programs success in meeting this goal by next year.

Goal **Training Geographically Informed Students - Cultural Aspects** 🔑
 Students completing the core courses required for a Geography degree will demonstrate knowledge of cultural geography including both human systems and the interaction between the environment and society.

Objective (L) **Demonstrate Knowledge Of Cultural Concepts In Geography** 🔑
 Students completing the core courses required for a Geography degree will demonstrate knowledge of cultural geography including both human systems and the interaction between the environment and society.

Indicator **Cultural Geography Concepts** 🔑
 Students will correctly answer the embedded questions on exams during the semester that address cultural geography. The areas of emphasis include human systems and the environment and society.

Criterion **70% Accuracy On Cultural Concepts** 🔑
 Students will score 70% correct on those questions pertaining to each of the two areas of emphasis associated with cultural geography concepts.

Finding **Student Learning Outcomes Concerning Cultural Concepts** 🔑
 Students enrolled in GEOG 3350 scored an average of 74% on a set of questions focused upon human systems. Students enrolled in GEOG 1321 scored an average of 67% on those same questions. Students enrolled in GEOG 3350 scored 65% on questions concerning the interaction of the environment and society, while students enrolled in GEOG 1321 scored an average of 62% on these questions.

Action **Improving Knowledge Of Cultural Aspects Of Geography** 🔑
 Results of this assessment suggest that geography students continue to possess adequate knowledge of various aspects of cultural geography, particularly those enrolled in GEOG 3350. In previous assessments student scores for both relevant courses, GEOG 1321 & GEOG 3350, were aggregated. Upon recording and reporting the results from the two courses separately, it becomes apparent that students enrolled in GEOG 3350 do significantly better than students enrolled in GEOG 1321. This is largely the function of the fact that students enrolled in GEOG 3350 tend to be juniors and seniors, while GEOG 1321 generally enrolls far more newly incoming students, particularly

freshmen. Moreover, GEOG 3350 (Cultural Geography) directly focuses on the relevant subject matter. Students enrolled in these courses do less of a better job in demonstrating satisfactory knowledge of interactions between the environment and society. Future assessments will present the results for students enrolled in a new course (GEOG 2301; Environmental Geography) offered for the first time in Spring 2014. Thus, we are confident that we can convey a better idea of how well geography students are doing in this subject area during the next assessment cycle.

Previous Cycle's "Plan for Continuous Improvement"

Some of the program weaknesses identified by this assessment will be mitigated by the offering of a new course; Environmental Geography. This new course will directly focus upon material pertaining to the awareness of physical systems and the relationships between the environment and human society. The addition of new faculty member will also enable us to strengthen our concentration in Environmental Geography via the offering of new courses focused on this subject matter. Certain other learning gaps identified by the assessment may simply reflect weaknesses with the assessment itself. For example, we offer a few courses that focus on regional geography (World Regional Geography, Regional Geography of U.S. and Canada), that would naturally focus more directly on "places and regions" than would the courses incorporated in this assessment. In the future we will embed assessment questions within the comprehensive finals associated with these regional courses. The most critical weaknesses identified from this assessment remain in the areas of learning major geographic principles and critical thinking. The scores from students enrolled in one course (GEOG 1321) did improve for these areas, We plan to continue to experiment with ways to enhance critical thinking in both lab and lecture formats, and will make concerted efforts to incorporate assignments and methods found to be successful in GEOG 1321 at generating positive learning outcomes.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

Two of the courses - GEOG 1401 (formerly 1301) and GEOG 1321 - utilized for this assessment have been fully redeveloped so that they comply with the new core curriculum, which goes into effect in Fall 2014. During this process these courses were specifically restructured so that they would facilitate the exact learning outcomes reflected in the goals of this assessment, such as critical learning and awareness of major geographic principles. Two other courses (GEOG 2355 & 2356) were also redeveloped for the new core, both emphasizing the teaching of other recognized goals (ex. "places and regions"). These two courses were utilized for assessment for the first time this past spring, but results are not yet in a format that could be presented here. Given the restructuring of these courses to more directly serve the goals outlined on this assessment, analysis of student outcomes associated with future sections of these courses will be informative. A new Environmental Geography course was taught for the first time in Spring 2014, a course which focuses more directly on physical systems and human-environment interaction than any other course in our curriculum. These same two subject areas represent two identifiable weaknesses within our program. Given that this brand new course was offered by a new faculty member, it was not possible to generate results as of yet. We fully expect to have a better picture during the next assessment cycle of how well our program is doing at enhancing this particular need.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

Many of the weaknesses identified by student outcomes from this assessment represent weaknesses that have also been recognized on previous assessments. To that effect, we have proactively redesigned some of our courses to better serve the needs for enhanced critical thinking and to facilitate the learning of both basic and major geographical concepts. We have also attempted to replicate methodologies proven to be effective in some courses (GEOG 1321) so that they could be implemented in other courses. Some of these methodologies, when applicable, will be implemented in lab sections so that we can take advantage of the intimacy of smaller class sizes. We plan to further improve upon this overall endeavor by incorporating the assessment of additional courses that better serve certain specific goals, such as World Regional Geography and Environmental Geography. These courses should offer a better test of how well we our program is doing at teaching "regions and places" and "physical systems," respectively. Perhaps the biggest change we have made involves our efforts to fix the identifiable need to enhance student understanding of basic statistical measures, a weakness reflected within this assessment. Based on these results, we have restructured our degree requirements so that all geography majors will be required to successfully complete a basic statistics course. In addition, we have also incorporated some elementary statistical procedures within one of our introductory geography courses (GEOG 1321). Finally, we plan to continue our efforts to experiment with different ways to enhance learning across our curriculum in order

to generate positive learning outcomes.

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**Department of Mathematics
and Statistics**



Online Assessment Tracking Database

Sam Houston State University (SHSU)
2013 - 2014

Mathematics BA

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Goal **Deliver A Lower-Level Curriculum With Appropriate Discipline Specific Skill Sets**

The curriculum will provide freshman and sophomore students with opportunities to develop the skills typically required of professionals in the area of study.

Objective (L) **Foundation Areas - Calculus I**
 Mth142 (Calculus I): Students will demonstrate the following knowledge and skills: differentiation of standard mathematical functions, apply the Fundamental Theorem of Calculus to evaluate integrals, and use calculus techniques to solve optimization problems.

Indicator **Course Assessment - Math1420**
 All students in the program are required to complete Math1420. Students will be administered a final exam containing some common questions developed and approved by the faculty teaching Math1420. The exam will require the students to demonstrate the knowledge and skills mentioned in the objective.

Criterion **Differentiation Of Mathematical Functions**
 On the final exam, 70% of the students will provide the correct derivative for a given mathematical function.

Finding **Differentiation**
 Of 176 final exam problems concerning optimization, 129 (or 73%) received a passing grade on that problem.










Criterion **Optimization Using Calculus Techniques**
 On the final exam, 70% of the students will use the appropriate calculus techniques to solve an optimization problem.

Finding **Optimization**
 Of 176 final exam problems concerning optimization, only 72 (or 41%) received a passing grade on that problem.

Criterion **Fundamental Theorem Of Calculus**
 On the final exam, 70% of the students will correctly evaluate a definite integral using the Fundamental Theorem of Calculus

Finding **Integration**
 Of 176 final exam problems concerning optimization, 127 (or 72%) received a passing grade on that problem.

Action **Need To Work On Optimization Applications**
 We clearly need to pay more attention to the performance of our students pertaining to applications of the derivative, particularly optimization problems. Difficulty often arises not only when applying calculus, but earlier, in the setup of the problem. Our new precalculus course, MATH 1410, is designed to help with some of these deficiencies. It's too early to tell whether or not this new course is helping the performance of our calculus students.

Goal	Deliver An Upper-Level Curriculum With Appropriate Discipline Specific Knowledge 
	The curriculum will address the discipline specific knowledge dictated by professional societies and/or professionals in the workforce for upper-level instruction in mathematics.
Objective (L)	Advanced Areas For Majors  Students preparing to graduate will demonstrate advanced mathematics knowledge and skills.
Indicator	Euclidean Geometry Project - Math3363   Students will complete a project requiring them to use technology to create conjectures and then provide a proof of their conjecture.
Criterion	Project Assessment   At the end of the semester, 85% of the students submitting their project will receive a rating of 8 out of 10 or better according to the attached rubric.
Finding	3363 Project   Of the 25 students that participated in the project, 20 received a score above 80%. The mean grade on the assignment was an 88%. This is better than we had hoped for in the objective.
Action	Continue To Monitor Success  We will continue to monitor the progress of our students in this course. While it is a required course for future secondary teachers, enrollment is not that high (25 in 2014). more monitoring is therefore necessary.

Previous Cycle's "Plan for Continuous Improvement"

We will implement a new placement exam for MATH 1420/1410.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

The placement exam for 1410/1420 has been in place since Summer 2014, in hopes fo correctly placing Fall 2014 students. Upon completion of the semester, we will compare the performance of those students that took the placement exam with their grade in either 1410 or 1420. The results of this comparison will begin to tell us the value of the placement exam. Although, few students took the exam; several semesters will be needed in order to assess the value of the placement exam.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

We have plans to apply for 3 different NSF grants: two interdisciplinary STEM-centered projects that will improve our STEM course offerings, and one research grant (PI: J. Wang).

We will hire two new faculty members, in the hopes of increasing our breadth of our graduate and advanced undergraduate course and research offerings. We also hope to find new colleagues that have interests in community outreach and the development of a STEM center on our campus (one of the goals of the NSF grants mentioned above).



Online Assessment Tracking Database

Sam Houston State University (SHSU)
2013 - 2014

Mathematics BS

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Goal **Deliver A Lower-Level Curriculum With Appropriate Discipline Specific Skill Sets**

The curriculum will provide freshman and sophomore students with opportunities to develop the skills typically required of professionals in the area of study.

Objective (L) **Foundation Areas - Differential Calculus**

MATH 1420 (Calculus I): Students will demonstrate the following knowledge and skills: differentiation of standard mathematical functions, application of the Fundamental Theorem of Calculus to the evaluation of integrals, and using calculus techniques to solve optimization problems.

Indicator **Course Assessment - Mth142**

All students enrolled in the program are required to complete Mth 142. Students will be administered a final exam developed and approved by the department faculty. The exam will require them to demonstrate the knowledge and skills mentioned in the objective.

Criterion **Optimization Using Calculus Techniques**

On the final exam, 70% of the students will use appropriate calculus techniques to solve an optimization problem.

Finding **Optimization**

Of 176 final exam problems concerning optimization, only 72 (or 41%) received a passing grade on that problem.

Criterion **Differentiation Of Mathematical Functions**

On the final exam, 70% of the students will provide the correct derivative for a given mathematical function.

Finding **Differentiation**

Of 176 final exam problems concerning optimization, 129 (or 73%) received a passing grade on that problem.

Criterion **Fundamental Theorem Of Calculus**

On the final exam, 70% of the students will correctly use the Fundamental Theorem of Calculus to evaluate a given integral.

Finding **Integration**

Of 176 final exam problems concerning optimization, 127 (or 72%) received a passing grade on that problem.

Action **Need To Work On Optimization Applications**

We clearly need to pay more attention to the performance of our students pertaining to applications of the derivative, particularly optimization problems. Difficulty often arises not only whe applying calculus, but earlier, in the setup of the problem. Our new precalculus course, MATH 1410, is designed to help with some of these deficiencies. It's too early to tell whether or not this new course is helping the performance of our calculus students.

Goal	Improve Communication Between Department And Its Majors 🔑 Communicate to our mathematics majors more and better information pertaining to internships, research opportunities, scholarships. etc.
Objective (P)	Improve Communication Between Department And Mathematics Majors 🔑 Communicate to our mathematics majors more and better information pertaining to internships, research opportunities, scholarships. etc.
Action	Have A Winter Meeting For All Mathematics Majors And Minors 🔑 In January 2015, the chair will host an hour-long meeting of all mathematics majors and minors. This meeting will inform all students of summer REU opportunities (application deadlines typically in February), graduate school opportunities (deadlines in March) and new courses available for Fall 2015/Spring 2016. All faculty will be invited, and slides will be prepared in order for students not able to attend to have the opportunity to receive the same information. These slides will be made available on the departmental website. An announcement will be made via email 3 weeks before the date, with a reminder sent one week prior. Other actions will include the possibility of hosting a departmental Twitter account maintained by the office to better inform students of new sections of courses opened, advising deadlines, etc.

Goal	Deliver An Upper-Level Curriculum With Appropriate Discipline Specific Knowledge 🔑 The curriculum will address the discipline specific knowledge dictated by professional societies and/or professionals in the workforce for upper-level instruction in mathematics.
Objective (L)	Advanced Areas For Majors 🔑 Students preparing to graduate will demonstrate advanced mathematics knowledge and skills.
Indicator	Euclidean Geometry Project - Math3363 🔑 🔑 Students will complete a project on the role of proof and technology in communicating mathematics.
Criterion	Project Assessment 🔑 🔑 At the end of the semester, 70% of the students submitting their project will receive a rating of 8 out of 10 or better according to the attached rubric.
Finding	3363 Project 🔑 🔑 Of the 25 students that participated in the project, 20 received a score above 80%. The mean grade on the assignment was an 88%. This is better than we had hoped for in the objective.

Action

Continue To Assess 

We will continue to monitor the progress of our students in this course. While it is a required course for future secondary teachers, enrollment is not that high (25 in 2014). more monitoring is therefore necessary.

Previous Cycle's "Plan for Continuous Improvement"

We will implement a new placement exam for MATH 1420/1410.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

The placement exam for 1410/1420 has been in place since Summer 2014, in hopes fo correctly placing Fall 2014 students. Upon completion of the semester, we will compare the performance of those students that took the placement exam with their grade in either 1410 or 1420. The results of this comparison will begin to tell us the value of the placement exam. Although, few students took the exam; several semesters will be needed in order to assess the value of the placement exam.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

We have plans to apply for 3 different NSF grants: two interdisciplinary STEM-centered projects that will improve our STEM course offerings, and one research grant (PI: J. Wang).

We will hire two new faculty members, in the hopes of increasing our breadth of our graduate and advanced undergraduate course and research offerings. We also hope to find new colleagues that have interests in community outreach and the development of a STEM center on our campus (one of the goals of the NSF grants mentioned above).

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Online Assessment Tracking Database

Sam Houston State University (SHSU)
2013 - 2014

Statistics MS

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Goal	Deliver A Curriculum With Appropriate Discipline Specific Skill Sets   The curriculum will provide students with opportunities to develop the skills typically required of professionals in the area of study.
Objective (L)	Foundation Areas In Probability And Statistics  Students will have a working knowledge of the foundational topics including regression analysis, design of experiments, multivariate analysis, and mathematical statistics (Bayesian analysis, biostatistics, quality control, nonparametric statistics, sampling theory, Time Series Analysis, and statistical computing).
Indicator	Comprehensive Oral Examination   A comprehensive oral examination, given by a committee of three faculty members, will be administered to candidates for the degree of M.S. in Statistics which will examine the candidate's knowledge of the primary areas of concentration within the program, as well as the candidates own communication abilities. The committee will then judge the candidates' knowledge of the material according to a previously agreed upon rubric with three levels of comparison: High Pass, Pass, and Fail.
Criterion	Multivariate Analysis  All candidates will receive a mark of either "High Pass" or "Pass" for the Multivariate Analysis component of the comprehensive oral exam. The rubric used is the same one shown in the "Mathematical Statistics" criterion.
Finding	Multivariate Results  Out of the seven students 3-high passes and 4-passes.
Criterion	Regression Analysis  All candidates will receive a mark of either "High Pass" or "Pass" for the Regression Analysis component of the comprehensive oral exam. The rubric used is the same one shown in the "Mathematical Statistics" criterion.
Finding	Regression Results  Three high passes and four passes
Criterion	Mathematical Statistics   All candidates will receive a mark of either "High Pass" or "Pass" for the Mathematical Statistics component of the comprehensive oral exam.
Finding	MATHSTAT Results  Three high passes and four passes
Criterion	Design Of Experiments  All candidates will receive a mark of either "High Pass" or "Pass" for the Design of Experiments component of the comprehensive oral exam. The rubric used is the same one shown in the "Mathematical Statistics" criterion.

Finding

Results 🔑

All seven students successfully completed the oral comprehensive exams. However, we saw one student was a bit stressed out due to the busyness at the end of the last semester. Statistics faculty plans to monitor closely these kind of students and advise them with time management early in the last semester.

Finding

Successfully Completed 🔑

All seven students successfully completed the oral comprehensive the oral comprehensive exams. However, we saw one student was a bit stressed out due to the busyness at the end of the last semester. Statistics faculty plans to monitor closely these kind of students and advise them with time management early in the last semester.

Finding

DOX Results 🔑

Two high passes and five passes

Action

Monitoring Students Success After Graduation 🔑

We monitor students success after graduation to see if changes should be made to produce better quality graduates.

Goal

Deliver A Curriculum That Emphasizes Communication Skills 🔑

The curriculum will provide students with opportunities to develop the appropriate speaking and writing skills to function as a professional in the area.

Objective (L)

Communicating Mathematical Ideas - Oral 🔑

Students will be able to prepare and deliver oral presentations of mathematical material based on a statistics practicum. Students will develop the ability to critique problems, and provide their own solutions based on statistical analysis.

Indicator

Statistics Practicum 🔑

A statistics practicum, under the guidance of one of the faculty members, and assessed by a committee of four faculty members, will be administered to candidates for the degree of M.S. in Statistics which will examine the candidate's knowledge of the primary areas of concentration within the program, as well as the candidates own communicative abilities. The committee will then judge the candidates' ability to effectively communicate mathematical ideas according to a previously agreed upon rubric with three levels of comparison: High Pass, Pass, and Fail.

Criterion

Practicum Assessment 🔑 🔑

All candidates will receive a letter grade by the members of the examining committee during the practicum assessment according to the attached rubric.

Finding

Practicum Results 🔑

All seven students successfully completed the practicum intime.

There are no actions for this objective.

Goal **Consistent Cohort Of Graduate Students Each Year** 

A cohort of ten supported graduate students each year allows us to maintain a healthy program with consistent class sizes and class schedules.

Objective (L) **Support Ten New Students Each Year** 

We will support ten new graduate students each year, as many as twenty in the two years of our program. Support should be such that fulltime students are supported by at least \$10,000 more than the cost of tuition

and fees.

Action **Communicate With University Administrators** 

We will request additional TA positions from Dean of Graduate Studies

Goal **Improve Instruction By TAs** 

We will improve our instructional support for TA instruction in our elementary Statistics courses.

Objective (L) **Encourage And Train Teaching Assistants For Teaching** 

Will encourage and assign teaching assistants in elementary statistics courses as instructors.

Indicator **Evaluation TA** 

Teaching evaluations and classroom visits by faculty

Action **Offer Teaching Duties** 

Offer teaching duties for students with 18 hours of grad courses

Previous Cycle's "Plan for Continuous Improvement"

The statistics faculty still believe this applies this year. They are constantly examining their program to make sure it reflects current trends and needs in their area. Statistics faculty decided to observe closely and help with the non-English speaking students throughout the program. Statistics faculty also decided to offer two more core courses (Regression and Design of Experiments) every year instead of every other year. This will allow students to get the basics of the subject in their first year of the program. Improving physical facilities such as lab spaces and office spaces for graduate students is also a key area that should be addressed.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

All of our non-English speaking students completed the program successfully. Regression and Design & Analysis of Experiment courses are now scheduled every year instead every other year. TA offices were renovated. However, we still need more office space for students.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

We need more TA positions to have a healthy cohort of students. And also current TA stipend is not adequate. Our students are struggling financially due to low stipend and we are planning to communicate this to the university administration. Need at least one more faculty member. We need more office space for students.

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Department of Physics



Online Assessment Tracking Database

Sam Houston State University (SHSU)
2013 - 2014

Physics BS

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Goal	<p>Provide The Necessary Basic Skills For Beginning Students In Physics, The Physics/engineering Dual Degree And Pre Engineering Programs</p> <p>The Department of Physics provides discipline-specific offerings for beginning students in physics, the dual degree in physics/engineering and pre engineering</p>
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Objective (L) **Apply Foundational Concepts**

Students who complete the second course in calculus based Physics will be able to apply foundational concepts, particularly in the areas of (1) proofs and derivations, and (2) translation of written problems into mathematical equations.

Indicator **Comprehensive Exam**

Students will complete a faculty-developed comprehensive exam in Physics 1411 assessing the common foundational concepts in Physics.

Criterion **80% Score 70% Or Higher**

Eighty percent of students completing the exam will score 70% or higher on the comprehensive exam.

Finding **Report On Pre/Post Test Performance In Introductory Calculus-Based Physics (1411)**

This report documents the differential pre/post examination performance of 32 students enrolled in Physics 1411 during the Spring of 2014. These students are partitioned into two approximately equal subgroups, consisting of A: 17 students (primarily physics and pre-engineering majors) who had previously completed the new "Physics Bootcamp" (PHYS 1401), and B: 15 students (equally mixed among phys/pre-eng, mathematics, other) who had not.

Group A was somewhat academically younger than group B; the respective classification index (Freshman = 1, Sophomore = 2, etc.) averages were 2.3 and 2.7.

Group B was substantially more experienced in formal mathematics, with 1.9 average semesters of calculus completed, as opposed to 1.0 for group A.

Groups A and B exhibited parity (0.6) with regard to previously completed semesters of physics education, awarding a half point for high-school credit, general science exposure, and incomplete college terms.

The exam consisted of 15 multiple choice physics questions appropriate to the study of introductory classical mechanics at the university level. A quarter point deduction was made for incorrect answers in order to subtract out statistical background noise associated with guessing, and negative values were zeroed out. Normalized results will be reported in units of the inclusive (all students) standard deviation associated with raw scores on the pre-test.

Group A out-performed group B on the pre-test, with an average normalized score of 1.2, as opposed to 0.5.

Groups A and B performed identically (2.0) on the post-test. The class as a whole experienced an improvement of 1.1 standard deviations, more than doubling their averaged raw pre-test score.

Conclusions: The "Physics Bootcamp", which functions largely as a quantitative leveling and preparatory agent, has successfully compensated for a full semester deficit of formal training in calculus, when gauged by final outcome. It moreover provides an effective "head start" in specific physics knowledge, although this advantage becomes washed out by the end of a full term of focused physics study. The results presented are preliminary and additional statistical support is required.

Action

Require Physics 1401 Before Taking 1411

Students are required to take physics 1401, physics boot camp, before taking 1411. It is anticipated that Physics boot camp will give students the necessary quantitative skills for success in physics 1411.

Goal

Competence For Bachelor Of Science

Seniors studying Physics will demonstrate competence to graduate with a Bachelor of Science in Physics

Objective (L)

Mastery Of Fundamental Principles In Physics

Students preparing to graduate with a BS in Physics will demonstrate comprehension of fundamental principles and the ability to apply these principles in solving problems.

Indicator

Previous GRE Subject Test In Physics

Students will complete a common earlier version of the Graduate Record Subject Exam in Physics related to PHY 4370 (Classical Mechanics) under GRE standardized conditions. Faculty will have classified the questions into domains specific to the major principles in this area.

Criterion

Above 50th Percentile

Students will score above the 50th percentile determined as a result of the graduating seniors' scores from the common exam. A raw score of 50% is in the 74th percentile for the Physics GRE with a ¼ penalty for wrong answers.


Finding

Results Of Test Based On Physics GRE Questions DRAFT

In the pre test (first day of class) , the average score was 1 out of a

maximum score of 17. On the post test, (last day of class), the average score was 3.9 out of 19.

Action

Emphasize When And When You Shouldn't Use The Lagrangian 

We plan to work harder problems (for example problems in the book on mechanics by Kleppner and Kolenkow) where using free body diagrams and Newton's law is a better approach then the Lagrangian.

Previous Cycle's "Plan for Continuous Improvement"

We will repeat the assessment for Physics 1411 and Physics 4370. Improved statistics are needed for a valid assessment.

Please detail the elements of your previous "Plan for Continuous Improvement" that were implemented. If elements were not implemented please explain why, along with any contextual challenges you may have faced that prevented their implementation.

The beginning assessment was administered in Physics 1411 and Physics 4370.

Plan for Continuous Improvement - Please detail your plan for improvement that you have developed based on what you learned from your 2013 - 2014 Cycle Findings.

The "Physics Bootcamp", which functions largely as a quantitative leveling and preparatory agent, has successfully compensated for a full semester deficit of formal training in calculus, when gauged by final outcome. The results presented are preliminary and additional statistical support is required.

The emphasis in physics 4370 on when to use the Lagrangian and when to use Newton's laws directly has appeared to improve performance on the GRE. Again, the sample size is small and additional statistical support is needed.

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