



Sam Houston
State University

2011-2012

College of Sciences

**Department of Agriculture
and Industrial Sciences**



Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

Agriculture BS

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Goal	Knowledge Of Key Concepts And Skills	
Students will develop knowledge and skills relevant to agriculture.		

Objective (L)	Development Of Students' Knowledge And Skills
Students will be able to demonstrate competency in key areas of agriculture leadership.	

Indicator	AGRI 4388 Assignment Rubric
All students enrolled in the program must complete AGRI 4388 in their senior year. AGRI 4388 addresses key concepts and skills relevant to the field of agriculture and leadership. Each semester seven randomly selected student assignments from AGR 488 will be reviewed by faculty members with expertise in the field of agriculture. 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
Faculty in the Agriculture Department will assess the knowledge of agriculture from students enrolled in AGR 4388. At least 70% of the students will be expected to perform at an acceptable level (meets expectations) or higher. Specific focus will be in the areas of clarity and grammar which were identified as weakness in 2010-2011.	

Finding	Faculty Assessment
Selected materials for assessment had an average score of 3.4 which indicates that the student met the expectations of the course assignment. Areas of improvement include grammar and, to a lesser extent, clarity. As compared to 2010-11, students showed and improvement in clarity, yet had a lower score for grammar - multiple students had 4 or more errors. Professionalism was the highest assessed criterion.	

Action	Student Performance
Students' writing skills are still a concern and weakness. Though the actual score was lower than last year the students still achieved the expectations. Faculty will strongly suggest students utilize the writing center to strengthen the weaker outcomes in grammar and clarity.	

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

Objective (L)	Development Of Marketplace Skills
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Students completing the BS in Agriculture will demonstrate skills necessary to compete in the professional marketplace.

Indicator

AGRI 4120 Assignment Rubric  

All students seeking a degree in Agriculture will be required to complete AGRI 4120 during their senior year. The course addresses essential skills necessary to compete in the marketplace 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 Rated As Meeting Expectations 

Faculty evaluations will indicate that at least 70% of the 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. Improvements in grammar and wordiness will be sought (weakness in 2010-11).

Finding

Faculty Evaluation 

Business Portfolios were evaluated by faculty utilizing the attached rubric. Students showed improved scores in grammar and wordiness from past assessment period. Faculty utilized external resources and examples to demonstrate ideal portfolios. Average score was 4.5; weakness was about the information included in the portfolio - some students still provided material that was irrelevant, thus categorized as wordy.

Action

Portfolio Assessment 

Submitted professional portfolios from students in AGRI 4120 met the expectations set by the faculty. A few students failed to be concise in their materials causing lower scores for wordiness. Faculty will emphasize the importance of conciseness and grammar.

Closing the Loops Summary

Expectations were achieved; however, importance of professional presentation and grammatical accuracy will remain an emphasis to enhance marketability of students and increase their success after graduation.

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Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

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 economics, management, marketing, and finance.
Indicator	AGRI 4386 Assignment Rubric   All students enrolled in the program must complete AGRI 4386 in their senior year. AGRI 4386 addresses key concepts and skills relevant to the field of Agri-Business. Each semester seven randomly selected student assignments from AGRI 4386 will be reviewed by faculty members with expertise in the field of agriculture. 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 Evaluators that at least 70% of the students enrolled AGRI 4386 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 2010/2011.
Finding	Faculty Assessment Of Ag Business Students  Evaluation of student outcomes in AgriBusiness was an average score of 3.8, though over 70% of the students met faculty expectations, deficiencies were observed in grammar, lack of conciseness and organization of thought. Most students did not effectively utilize the writing center, and the department lost a senior faculty due to resignation.
Action	Faculty Review  Faculty in AgriBusiness reviewed curriculum and teaching materials. Several courses are being modified to ensure courses are providing adequate background and prerequisites for this capstone course. Goal is to advance the score to 4.0. Writing center will become a course requirement.

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 Rated As Meeting Expectations 

Faculty evaluations will indicate that at least 70% of the Agri-Business students enrolled in AGR 412 will perform at an acceptable level and score a 3 (meets expectations) or higher on a scale of 1-5. Weaknesses in 2010-11 were wordiness and organization.

Finding

Professional Skills 

Selected portfolios for evaluation had an average score of 4.5 from the utilized rubric. Once again, organization was a weakness; however, grammar was also an area needing attention.

Action

Marketability 

Students met criterion established by the faculty for marketing traits. The faculty were pleased with the improvement of the students from previous assessments. However this important criterion must continually be assessed.

Closing the Loops Summary

Faculty will review curriculum in to ascertain the prerequisite structure for Agri Business course and required courses. Assessed student outcomes in AGRI 4386 will be expected to achieve a 4.0 average.

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Online Assessment Tracking Database


Sam Houston State University (SHSU)
2011 - 2012



Industrial Technology BS


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Goal **Develop Knowledge And Skills** 
 Students will develop knowledge and 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.


Indicator **Advanced Technology Course Assignment Rubric** 
 All students enrolled in the program must complete the Advanced Industrial Technology course in their final year of enrollment. The course addresses key concepts and skills relevant to the field of Industrial Technology. Each semester seven randomly selected student assignments from the Advanced Industrial Technology course will be reviewed by faculty members with expertise in the field of industrial technology. 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 80% Meeting Expectations**  
 There will be a general consensus among I T Faculty members that at least 80% of the students enrolled in the advanced production course will perform at an acceptable level with a score of 3 (meets standards) or higher.

Finding **Student Assessment** 
 Evaluated students received an average score of 4.0 for their drafting portfolio. Students were able to effectively utilize software programs to demonstrate their skill. Accuracy of design and advanced techniques were weaknesses. The assessment goal was obtained by the evaluation team.

Action **Drafting Program** 
 Faculty will emphasize and spend more time in drafting lab and exercises to increase accuracy of developed designs. We will also consider increasing their expectations to an average score of 4.0.

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 4390 Internship Evaluation**  

All students enrolled in the program must complete ITEC 4390 in their final year of enrollment. ITEC 4390 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 4390 demonstrated an acceptable level of performance on the rating scales.

Finding

Performance During Internship 🔑

All students successfully completed their internship. Although there was variability of student assessments from supervisors, all students achieved a minimal score of a 3.0 (average performance) in their performance indicators. Many scored 4's and 5's. Professional appearance was excellent. Most variation between interns was competence.

Action

Internship Program Assessment 🔑

Faculty will review curriculum to determine inadequacies that could cause variation in student competency. More time will be spent to match company and job requirements with student skill set. We will consider advancing expectations to 4.0 for next assessment period.

Closing the Loops Summary

Students have demonstrated success in skill sets required by the assessing faculty. We plan to increase expectations for next academic year. Spending more time in the drafting lab working on exercises to increase design accuracy will be a priority.

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Online Assessment Tracking Database



Sam Houston State University (SHSU)
2011 - 2012


Industrial Technology BS (Construction Management)


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Goal **Develop Knowledge And Skills** 
 Students will develop knowledge skills relevant to Construction Management.

Objective (L) **Development Of Students' Knowledge And Skill** 
 Students will be able to demonstrate competency in key areas of Construction Management.


Indicator **Advanced Design And Development Assignment Rubric**  
 All students enrolled in the program must complete the Advanced Construction Management course in their final year of enrollment. The course addresses key concepts and skills relevant to the field of construction management. Each semester seven randomly selected student assignments from the Advanced Construction Management course will be reviewed by faculty members with expertise in the field of industrial technology. 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 advanced I T course will perform at an acceptable level with a score of 3 (meets expectations) or higher. Identified weaknesses last year were organization and clarification and will be emphasized this evaluation period.

Finding **Professional Proposals** 
 Students successfully achieved faculty expectations of at least a 3.0 on professional portfolios. Areas of concern and weakness were organization and professional presentation of materials with slight grammatical errors. However, clarity and technical skill and understanding of content were obvious strengths. Average score was 3.7

Action **Construction Mgmt. Assessment** 
 Faculty will spend more time emphasizing the importance of organization of materials, writing skills and professional presentation. Most students in this program work on construction sites and are transient student; faculty deem this a reason for the lower scores in organization, etc., with minimal time for consolidating materials for presentation.

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 Construction Management will

demonstrate skills necessary to compete in the professional marketplace through an internship.

Indicator

ITEC 4390 Internship Evaluation  

All students enrolled in the program must complete ITEC 4390 in their final year of enrollment. ITEC 4390 addresses key concepts and skills, as well as practical demonstrations of competency relevant to the field of construction management. 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 70% of the students enrolled in ITEC 4390 demonstrated an above average level (4 or higher) of performance on the rating scales.

Finding

Internship Evaluation 

The average score was 4.2 for students completing internship. All students were successful in completing their service. Faculty expectations were achieved; however, a few students received lowered scores in competency and professional growth.

Action

Internship Assessment 

Student competency seemed to improve the longer the student was on the internship; therefore, it seems to be an idea that students' confidence increases and competency increases. Although students are taught the skills sets, it appears confidence at the actual job site may hinder these skills. Professionalism will be addressed.

Closing the Loops Summary

Professionalism will be a major trait emphasized by faculty and will incorporate the career placement center professionals and HR representatives from various companies to assist at the ITEC Career Fair. Additionally, organization, writing skills, and professional presentation will be emphasized.

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**Department of Biological
Sciences**



Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

Biology BS

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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) **Science And The Scientific Method** 🔑
 Description Students should have a general understanding of what science is and be able to apply the scientific method.

Indicator **MFT Analysis For BIO Majors** 🔑
 All graduating seniors are required to take the nationally standardized ETS Biology Major Field Test(MFT). Sections of the Biology MFT that correlate with an understanding of the scientific method and those that relate to understanding of the general nature of science are identified as programmatic assessments in these areas. We were not able to replace the MFT this year as we had hoped. Hopefully, we will be able to motivate more students to take it.

Criterion **MFT Analysis** 🔑
 All students are expected to score 50% or higher on the analytical skills indicators correlated with our foundational areas.

Finding **Assesement MFAT Sci Method** 🔑
 Biology did not conduct the MFAT this year because lack of departmental funding prohibited purchasing this test.

Indicator **CAT For Non-Science Majors** 🔑
 CAT is a standardized exam for critical thinking. Student performance on this exam should increase following the completion of a non-science major course (BIO 134, 137, and 146). The department, in conjunction with the University QEP, is establishing protocol for the administration of this standardized test and collecting baseline data in select freshman courses.

Criterion **CAT For Non-Science Majors** 🔑
 The CAT exam will be piloted in several sections of non-science major biology courses. Baseline data will be collected to establish a foundation for full implementation in subsequent years. 90% of students will score higher on the post-test than on the pre-test. We are eager to see if critical thinking skills improve this year.

Finding **CAT Assessment Sci Method** 🔑
 Biology did not conduct the CAT this year because lack of departmental funding prohibited purchasing this test.

Action **New Assessment Sci Method** 🔑
 Biology did not conduct the MFAT or CAT this year because lack of departmental funding prohibited purchasing this test. Biology is currently in the processes of developing new assessment tools. These will be run this year 2013.

Goal **Deliver A Curriculum With Appropriate Discipline Specific Knowledge** 🔑

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

Objective (L)	<p>General Understanding Of Core Fields 🔑</p> <p>Students should demonstrate familiarity with the following fields: 1) Botany- including plant morphology, taxonomy, genetics, physiology, and ecology 2) Zoology- including anatomy, behavior, physiology, ecology, and the systematic arrangement of the major animal taxa. 3) Cell biology- including macromolecules, metabolism, structure, and genetics.</p>
Indicator	<p>MFT Sections Related To Core Fields 🔑</p> <p>Sections of the nationally standardized MFT exam related to the three core fields of botany, zoology, and cell biology are identified as assessments of knowledge in the core fields.</p>
Criterion	<p>MFT Sections Related To Core Fields 🔑</p> <p>All graduating BIO majors will score at least the national average in all three core fields assessed by the MFT.</p>
Finding	<p>Assessment Core Fields 🔑</p> <p>Biology did not conduct the MFAT this year because lack of departmental funding prohibited purchasing this test.</p>
Action	<p>New Assessments Core Fields 🔑</p> <p>Biology did not conduct the MFAT or CAT this year because lack of departmental funding prohibited purchasing this test. Biology is currently in the processes of developing new assessment tools. These will be run this year 2013.</p>
Objective (L)	<p>Working Understanding Of Core Theories In Biology 🔑</p> <p>Students should have a working understanding of core theories such as cell theory, the central dogma, and evolution.</p>
Indicator	<p>MFT Sections Related To Core Theories 🔑</p> <p>Sections of the nationally standardized MFT exam (administered by the ETS) related to the three core theories, cell biology, molecular biology, and population biology and evolution are identified as programmatic assessment of the biological core courses. We had hoped to replace the MFT with another test; however, a new test was not yet available to the department. Once again, we have to rely on the MFT.</p>
Criterion	<p>MFT Core Theory 🔑</p> <p>All graduating BIO majors will score at least the national average in all three core areas assessed by the MFT.</p>
Finding	<p>Assessment MFAT Core Theory 🔑</p> <p>Biology did not conduct the MFAT this year because lack of departmental funding prohibited purchasing this test.</p>
Action	<p>New Assessments Core Theory 🔑</p> <p>Biology did not conduct the MFAT or CAT this year because lack of departmental funding prohibited purchasing this test. Biology is currently in the processes of developing new assessment tools. These will be run this year</p>

2013.

Closing the Loops Summary

Biology was unable to address the objectives stated in this program because funding prevented the administration of costly exit exams.

Currently, the biology assessment committee is in the process of devising a new assessment tool, using an exam designed in house.

This is addressed in the 2012-13 goals and objectives.

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Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

Biology MS

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Goal **Develop Students' Professional Skills** 🔑
 Students will develop the professional skills necessary to complete projects relevant to the field of biology.

Objective (L) **Communicate Research Findings** 🔑
 Each student will demonstrate the ability to communicate research findings in oral and written form through presentations at professional conferences and scientific publications

Indicator **Professional Aspects Course** 🔑
 All students are required to complete a professional aspects course (in their first semester, BIO520) in which they: 1) Prepare a mock proposal based on their research prospectus; 2) Deliver oral presentations of results in a simulated conference setting; 3) Prepare and edit manuscripts for publication. Student assignments are reviewed by 3 - 5 faculty members including their director.

Criterion **Professional Aspects Course** 🔑
 All graduate students will perform at a level deemed acceptable by the course instructor and associated faculty.

Finding **Graduates - Prof Aspects** 🔑
 8 graduate students went through the professional aspects course. 75% successfully completed all assignments with a grade of A (including manuscript prep and presentations). 25% completed with a grade of B. None recieved below a B.

Action **Professional Aspects Graduates** 🔑
 The department will continue to offer professional aspects and explore ways to increase mastery of objectives in this course.

Goal **Develop Students' Scientific Skills And Knowledge** 🔑
 Students will develop scientific skills and knowledge relevant to the field of biology.

Objective (L) **General Knowledge In Biological Sciences** 🔑
 Students completing the master's degree will possess sufficient knowledge in the general biological sciences to teach freshmen and sophomore level courses.

Indicator **Mastery Of Knowledge - Oral Exam** 🔑
 All graduate students will demonstrate mastery of graduate course content through an oral graduate comprehensive exam, administered by a faculty committee. The examination consists of questions in three areas of concentration, depending on the student's emphasis and research area. While questions are originally posed by the faculty member who taught the respective courses, all members of the committee or faculty who are present may probe the student's understanding of the material through further questions.

Criterion

Mastery Of Knowledge - Oral Exam 🔑

Each student is required to pass all three areas addressed in the examination as determined by a consensus of the entire committee. In the event that a student does not pass a portion(s) of the oral exam, the committee may choose to offer the student a written examination. The student MUST pass the written exam to continue in the program.

Finding

Oral Exam Completion 🔑

9 students successfully completed comprehensive oral exams given by a faculty committee of 3 members. Successful completion indicates faculty approval that the student has a master of the general knowledge in the biological sciences.

Action

Continue Activities - Oral Exams 🔑

The biological sciences will continue to administer oral exams to exiting MS students. The department will consider developing a standard way of evaluating these exiting exams.

Goal

Develop Students' Knowledge Of A Subfield In Biology 🔑

Students pursuing the thesis route will develop detailed knowledge in a subfield of biology.

Objective (L)

Detailed Knowledge Of Current Research 🔑

Each student will develop detailed knowledge of current research within their thesis area of biology.

Indicator

Thesis Bibliography 🔑

Each student completes a thesis describing their research problem, experiments, findings, and conclusions. To demonstrate relevance of the research topic, each student must prepare a detailed bibliographical outline of current research in the area. The ability to complete this section of the thesis will serve to demonstrate the students understanding and familiarity of the literature.

Criterion

Thesis Defense 🔑

As part of the defense of the thesis, thesis committee members evaluate the quality of the bibliographical presentation in the manuscript. All students must demonstrate a detailed knowledge of the literature through the preparation of this document before the thesis is approved.

Finding

Written Thesis Completion 🔑

7 Graduate students successfully wrote and defended thesis during this review period. Completion was awarded for each student through a consensus agreement of 3 faculty that the work satisfied a detail knowledge of their chosen biological discipline.

Action

Continue Activities - Theses Defense 🔑

The biological sciences will continue to administer thesis defenses to exiting MS students. The department review ways to encourage publication of theses before graduation.

Closing the Loops Summary

These data indicate that the biology department continues to meet targets by training MS students. The department will begin comparing pre and post knowledge based on the 2012-13 objectives.

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Department of Chemistry



Online Assessment Tracking Database

Sam Houston State University (SHSU)

2011 - 2012

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 17 students that took the exam (65 were invited to do so), 9 (53%) scored within one standard deviation of the mean or higher on the ACS standardized general chemistry examination. The criterion was not met overall. For chemistry majors (excluding forensic chemistry majors), 3 students took the exam (14 were invited to do so) and all (100%) scored within one standard deviation of the mean or higher, thus meeting and exceeding the criterion. Overall, the participation rate for the academic year was $17/65 = 26\%$ (and $3/14 = 21\%$ for chemistry majors and $14/51 = 27\%$ for forensic chemistry majors). We need to keep working on ways to encourage 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 1312 (General Chemistry II) is important. The scholarship money still seems to be a good incentive, but we still want to have increased participation. In an attempt to raise the level of participation, we will contact the majors earlier in the semester in an attempt to increase participation. In the past, notice was given to the students less

than one week before the exam was to be administered. We believe that because students receive lots of notices over the semester that earlier notification would not be beneficial. However, since the number of participants hasn't significantly increased, we will try multiple notifications.

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** 🔑

Of the 15 forensic chemistry and chemistry majors who took the exam (for whom we have data at hand), 11 (73%) scored within one standard deviation of the mean or higher on the ACS standardized organic chemistry examination. The criterion was not met overall for these students. For chemistry majors alone 8 out of 9 students (89%) met the criterion while for forensic chemistry majors only 3 out of 6 students (50%) met the criterion. Those students who did not meet the criterion will repeat CHEM 2325 (organic chemistry II) since this area was identified as needing improvement.

Action **Organic Chemistry** 🔑

Compared to last year, the results are less promising. However, the data is limited. Of the four sections of CHEM 2325 (organic chemistry II) offered in the fall and spring semesters, we only have data for two sections. These sections account for 47 of the 106 students enrolled on the 12th class day. It is our impression that this data is limited and not completely representative. We will endeavor to collect better data in the coming year and will assess the students' performance on an ongoing basis.

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)	<p>Demonstrate Understanding Of Instrumental Analytical Methods In Chemistry </p> <p>The modern analytical laboratory makes extensive use of electronic instrumentation for the analysis of chemical samples. Our Instrumental Analytical Chemistry course (CHM 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 CHM 4440 for more than a decade. (Note--the course number has changed from 440 to 4440)</p>
Indicator	<p>Examinations In Instrumental Analytical Chemistry  </p> <p>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.</p>
Criterion	<p>75% Of Chemistry Majors Meeting Expectations </p> <p>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 four examinations in this class. In 2010-2011, students tended to do slightly worse on the third exam which addressed complex reagent mixtures, HPLS schematics and nondispersive versus dispersive IR spectrometers. We are eager to determine whether the performance on the third exam requires intervention or is just statistical variability.</p>
Finding	<p>Performance On CHEM 4440 Exams  </p> <p>On the first, third and final exam, 24 of the 29 students (83%) scored within one standard deviation of the mean or higher. On the second exam, 25 of the 29 students (86%) scored within one standard deviation of the mean or higher. Overall the criterion was met. The exam with the highest test average was the third exam--clearly intervention is not needed.</p>
Action	<p>Monitor Instrumental Analysis Performance </p> <p>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. Since our students are hitting the 75% criterion, we will raise this to 80% next year.</p>

Goal	Deliver A Curriculum Appropriate For Mastery Of Advanced Chemistry Topics 
	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. (Note--the course number has changed from 448 to 4448)

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. We are particularly interested to see if students perform better in the area of molecular orbital theory relative to the 2010-2011 performance.

Finding**Physical Chemistry Final Exam Results** 🔑

More material was covered this year in CHEM 4448, and thus, there was more on the final exam. Of the 38 students who took the final, 87% of them made at least 60% on the final exam. The criterion was met. Very modest improvement was seen on the molecular orbital theory examination. Data for this exam back to 2007 shows a very wide variation from year to year.

Action**Physical Chemistry Action** 🔑

Since the data show, for example, on the molecular orbital theory examination that there is a wide variation in student performance from year to year (since 2007), yet the instructor's presentation and coverage of the material has changed to a lesser degree (there has been increased coverage of this material in the fall semesters of 2010 and 2011), it does not appear to be fruitful to focus on individual year variation in these numbers. We will assess student performance in this area on an ongoing basis.

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. In 2010-2011 we 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** 

All students received an acceptable peer-rating on a required research presentation. Within the course, each student evaluates all other student presentations. Student comments are improving, but we still want to remove any concern that student evaluators may have in regard to signing their evaluations. We will thus make their comments anonymous.

Action**Seminar Actions** 

Next year, the student evaluation forms will not have the evaluator's names on them. A different method of taking role in the class will be used.

Closing the Loops Summary

This year presented a new challenge, and as the year comes to an end, another challenge has presented itself.

The challenge that came crashing in last summer and permeated the year was the move to BANNER and Degree Works (for advising). A very practical issue with the conversion to Banner is our ability to count and track majors. In the old Legacy system, it was easy to do a report of both official majors and unofficial majors (and minors too) on the 12th class day. Official majors were those that had signed a declaration of major form and unofficial majors were those that had not. The 12th class day is the official "census" day for the semester. In the Legacy system, a student could change their unofficial major online at any time.

With BANNER, students can indicate a possible major when they first apply to the University, but after that they cannot change it online. They must fill out a paper form. This particularly impacts forensic chemistry majors. As incoming freshmen, many of the students think that all forensic topics must reside in the College of Criminal Justice, so they indicate that they are CRIJ majors. This leads to a decrease in the apparent number of forensic chemistry majors especially at the freshman level.

In the fall semester of 2011, the reporting aspect of BANNER (COGNOS) wasn't in place by the 12th class day. In fact, it wasn't really in place at the end of the fall semester. This means that we do not have 12th class day figures for majors. When the report is run after the 12th class day, the current (at whatever point the report is run) data are used, so if a student changes their major from some type of chemistry major to something else, they would not be counted. Of course, if they change to a chemistry major, they would be counted. Typically, however, we have considerably more students changing from chemistry to something else.

For the past five fall semesters, number of majors in chemistry and forensic chemistry were: 2007, 80 chemists, 159 forensic chemists (239 total); 2008, 88 chemists, 169 forensic chemists (257 total); 2009, 102 chemists, 177 forensic chemists (279 total); 2010, 108 chemists, 214 forensic chemists (322 total); and 2011, 110 chemists, 154 forensic chemists (264 total). Is the drop from 2010 to 2011 real? The spring data helps (for the past 5 years as well): 2008, 79 chemists, 136 forensic chemists (215 total); 2009, 79 chemists, 141 forensic chemists, (220 total); 2010, 95 chemists, 163 forensic chemists (258 total); 2011, 95 chemists, 188 forensic chemists (283 total); and 2012, 105 chemists, 201 forensic chemists (306 total). Thus we can tell that the apparent fall 2011 drop in majors is most likely a problem with when the data is collected--end of term versus 12th class day, and that, in general, our enrollments are still growing.

Not only is this difficulty related to the number of majors, it also relates to the identification of chemistry and

forensic chemistry majors in our courses. This is an issue particularly for general chemistry and organic chemistry where our assessments target these majors.

Hopefully the COGNOS reporting for majors will no longer be a problem, and the fall 2011 major numbers are an aberration.

The conversion to BANNER also caused issues with course prerequisites and the enforcement of those prerequisites. The legacy system rosters would flag students who did not meet the prerequisites. The BANNER system does not, which makes it harder to check to make sure that students who do not meet the prerequisites are removed from the course.

The change that is looming large in the summer of 2012 is the revision of the core curriculum.

With the changes in databases in the past year, and the absence of data for some of the organic results, definite conclusions for the past year's data are hard to reach. The best thing for us to do is to assess the situation on an ongoing basis, and try to increase participation in the general chemistry ACS exam.

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Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

Forensic Chemistry BS

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

The curriculum will address the discipline specific fundamental 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**ACS General Chemistry Test**

All forensic 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 forensic 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 exam. 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 17 students that took the exam (65 were invited to do so), 9 (53%) scored within one standard deviation of the mean or higher on the ACS standardized general chemistry examination. The criterion was not met overall. For forensic chemistry majors (excluding chemistry majors), 14 students took the exam (51 were invited to do so) and 6 scored within one standard deviation of the mean or higher ($6/14 = 43\%$). The criterion was not met for this group. Overall, the participation rate for the academic year was $17/65 = 26\%$ (and $3/14 = 21\%$ for chemistry majors and $14/51 = 27\%$ for forensic chemistry majors). We need to keep working on ways to encourage 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 1312 (General Chemistry II) is important. The scholarship money still seems to be a good incentive, but we still want to have increased participation. In an attempt to raise the level of participation, we will contact the majors earlier in the semester in an attempt to increase participation. In the past, notice was given to the students less

than one week before the exam was to be administered. We believe that because students receive lots of notices over the semester that earlier notification would not be beneficial. However, since the number of participants hasn't significantly increased, we will try multiple notifications.

Goal	<p>Deliver A Curriculum Appropriate For Understanding Instrumental Analytical Methods In Chemistry 🔑</p> <p>The curriculum will provide students with opportunities to develop the skills typically required of professionals in the area of instrumental analytical methods in chemistry.</p>
Objective (L)	<p>Demonstrate Understanding Of Instrumental Analytical Methods In Chemistry 🔑</p> <p>The modern analytical laboratory makes extensive use of electronic instrumentation for the analysis of chemical samples. Our Instrumental Analytical Chemistry course (CHM 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 CHM 4440 for more than a decade. (Note--the course number has changed from 440 to 4440)</p>
Indicator	<p>Examinations In Instrumental Analytical Chemistry 🔑 🔑</p> <p>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.</p>
Criterion	<p>75% Of Chemistry Majors Meeting Expectations 🔑</p> <p>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 four examinations in this class. In 2010-2011, students tended to do slightly worse on the third exam which addressed complex reagent mixtures, HPLS schematics and nondispersive versus dispersive IR spectrometers. We are eager to determine whether the performance on the third exam requires intervention or is just statistical variability.</p>
Finding	<p>Performance On CHEM 4440 Exams 🔑 🔑</p> <p>On the first, third and final exam, 24 of the 29 students (83%) scored within one standard deviation of the mean or higher. On the second exam, 25 of the 29 students (86%) scored within one standard deviation of the mean or higher. Overall the criterion was met. The exam with the highest test average was the third exam--clearly intervention is not needed.</p>
Action	<p>Monitor Instrumental Analysis Performance 🔑</p> <p>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. Since our students are hitting the 75% criterion, we will raise this to 80% next year.</p>

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 

Of the 15 forensic chemistry and chemistry majors who took the exam (for whom we have data at hand), 11 (73%) scored within one standard deviation of the mean or higher on the ACS standardized organic chemistry examination. The criterion was not met overall for these students. For chemistry majors alone 8 out of 9 students (89%) met the criterion while for forensic chemistry majors only 3 out of 6 students (50%) met the criterion. Those students who did not meet the criterion will repeat CHEM 2325 (organic chemistry II) since this area was identified as needing improvement.

Action Organic Chemistry 

Compared to last year, the results are less promising. However, the data is limited. Of the four sections of CHEM 2325 (organic chemistry II) offered in the fall and spring semesters, we only have data for two sections. These sections account for 47 of the 106 students enrolled on the 12th class day. It is our impression that this data is limited and not completely representative. We will endeavor to collect better data in the coming year and will assess the students' performance on an ongoing basis.

Goal Deliver A Curriculum Appropriate For Mastery Of Advanced Chemistry Topics 

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. (Note--the course number has changed from 448 to 4448)

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. We are particularly interested to see if students perform better in the area of molecular orbital theory relative to the 2010-2011 performance.

Finding**Physical Chemistry Final Exam Results**  

More material was covered this year in CHEM 4448, and thus, there was more on the final exam. Of the 38 students who took the final, 87% of them made at least 60% on the final exam. The criterion was met. Very modest improvement was seen on the molecular orbital theory examination. Data for this exam back to 2007 shows a very wide variation from year to year.

Action**Physical Chemistry Action** 

Since the data show, for example, on the molecular orbital theory examination that there is a wide variation in student performance from year to year (since 2007), yet the instructor's presentation and coverage of the material has changed to a lesser degree (there has been increased coverage of this material in the fall semesters of 2010 and 2011), it does not appear to be fruitful to focus on individual year variation in these numbers. We will assess student performance in this area on an ongoing basis.

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Action**Seminar Actions** 

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Closing the Loops Summary

This year presented a new challenge, and as the year comes to an end, another challenge has presented itself.

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Not only is this difficulty related to the number of majors, it also relates to the identification of chemistry and

forensic chemistry majors in our courses. This is an issue particularly for general chemistry and organic chemistry where our assessments target these majors.

Hopefully the COGNOS reporting for majors will no longer be a problem, and the fall 2011 major numbers are an aberration.

The conversion to BANNER also caused issues with course prerequisites and the enforcement of those prerequisites. The legacy system rosters would flag students who did not meet the prerequisites. The BANNER system does not, which makes it harder to check to make sure that students who do not meet the prerequisites are removed from the course.

The change that is looming large in the summer of 2012 is the revision of the core curriculum.

With the changes in databases in the past year, and the absence of data for some of the organic results, definite conclusions for the past year's data are hard to reach. The best thing for us to do is to assess the situation on an ongoing basis, and try to increase participation in the general chemistry ACS exam.

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Department of Computer Science



Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

Computing And Information Science MS

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Goal	<p>Technical Competence 🔑</p> <p>Graduates with a Master of Science in Computer Information Science will have a strong technical foundation in the computational sciences.</p>
Objective (L)	<p>Acquisition Of Theoretical, Technical And Project Management Skills 🔑</p> <p>Students will develop and demonstrate knowledge of theoretical materials technical skills and project management relevant to computer information systems.</p>
Indicator	<p>Final Project Assessment 🔑</p> <p>The final project in this degree program is a software engineering project that involves the students identifying a significant application development need for a selected client and the design and implementation of an appropriate software solution to that need.</p> <p>Each student is assigned to a member of the graduate faculty in computer science as project advisor together with two additional graduate faculty forming the student's committee.</p> <p>The department has established procedures for managing projects including</p> <ol style="list-style-type: none"> 1. The presentation of project proposals within the first two weeks of the semester. The graduate faculty review and approve or disapprove each proposal. 2. Weekly progress meetings with the project advisor. 3. The evaluation by the complete graduate faculty of each student's progress at midterm. 4. The distribution of project activity to the remaining members of each committee. <p>At the end of the project each student prepares and runs a formal presentation including a description of the project, detailed explanation of the solution used and a demonstration of the completed application.</p>
Criterion	<p>Final Project Assessment 🔑</p> <p>Students graduating will have documented consensus of the graduate faculty that they meet professional standards of software engineering. The department expects that 100% of students will successfully defend their project.</p>
Finding	<p>Final Project Assessment 🔑</p> <p>13 students presented their final projects in the 2011/2012 cycle, 2 in spring, 3 in summer and 8 in fall. All 13 students successfully defended their projects (100%). Only two students required more than 2 semesters to complete and successfully defend the project.</p>
Indicator	<p>Oral Examination 🔑</p> <p>One hour oral examination by the student's committee. The committee consists of three individuals, with one person designated as committee chair.</p> <p>Students are examined and given a grade of high pass, pass or fail in each of the following areas: Programming</p>

Software engineering
Database
Data Structures

and one other area of competence of the student's choosing.

Criterion

Oral Examination

We expect committee members to issue the score (high pass, pass or fail) on each of the knowledge areas to each student. 100% of students will score a pass or high pass on each area.

Finding

Oral Examination Findings

13 students were involved in Oral comprehensive Examinations during the 2011/2012 cycle. 12 students passed all areas of the comprehensive examination. 1 student failed the oral examination and the scheduled follow-up examination. The success rate for oral examinations was 92.3%

Action

Acquisition Of Technical, Ethical And Management Skills- Actions

In general the Graduate Curriculum Committee was satisfied with the results of the evaluation of students' acquisition of technical, ethical and management skills through the capstone assessment system in place. There were concerns that the oral examination may intimidate students and that those with English as a second language might be at a disadvantage in an oral situation.

As a result the Graduate Curriculum Committee has agreed to examine the potential for changing the oral examination to a written examination. The GCC will examine the logistics of how written examinations might be implemented and present their findings in the February 2013 department meeting.

Closing the Loops Summary

The findings appear to indicate that the graduate program in Computing and Information Science is effectively transmitting the theoretical, technical, ethical and managerial skills to students as evidenced by the students' performance in the oral examinations and in their defense of their capstone projects. The GCC will review the potential for written comprehensive examinations to replace oral examinations.

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Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

Computing Science BS

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<p>Goal</p>	<p>Specialized Competencies </p> <p>To develop students' skills and knowledge in their concentration areas. The department offers three concentration areas: Computer Science, Information Systems and Information Assurance and Security.</p>
<p>Objective (L)</p>	<p>Specialized Skills </p> <p>Students will develop and demonstrate skills and knowledge in their concentration areas. The department offers three concentration areas: Computer Science, Information Systems and Information Assurance and Security.</p>
<p>Indicator</p>	<p>Faculty Review  </p> <p>During department meetings faculty with expertise in the three concentration areas will discuss students' performances in their concentration areas. We expect that faculty in each concentration area will evaluate student performance across the 18 hours course sequence for each concentration.</p>
<p>Criterion</p>	<p>Specialized Skills Faculty Review Criterion </p> <p>In last year's review the faculty assessed more than 70% of the students were performing at or above expected levels. As a result the faculty set a higher expectation. We expect that the faculty will deem at least 72% or more of students' performances as acceptable.</p>
<p>Finding</p>	<p>Faculty Review </p> <p>For the formal assessment and evaluation of the performance of CS students, CS faculty developed tools and rubrics that can address the new ABET-CAC (Computing Accreditation Commission) criteria.</p> <p>First, four Program Education Objectives (E01-E04) and eleven Student Outcomes ((a)-(k)) for the Computer Science (CS) department at SHSU were established.</p> <p>Program Education Objectives are broad statements that describe what graduates are expected to attain within a few years of graduation, while Student Outcomes describe what students are expected to know and be able to do by the time of graduation.</p> <p>Secondly, CS core courses are mapped to the Student Outcomes to find the minimal number of courses for which self-study can be performed.</p> <p>Thirdly, member of the CS Undergraduate Curriculum Committee (UCC) arranged teams to prepare survey forms and assessment questionnaires for self-study that can be directly applicable for the new ABET-CAC assessment.</p> <p>During Fall 2011, CS faculty prepared the following assessment tools: (1) ABET Objectives Survey form, (2) ABET Outcomes Survey form, (3) Exit Interview form, (4) Exit Survey form, (5) Alumni Survey form, and (6) Employer Survey form. Furthermore, questions in each survey are mapped to the corresponding ABET objectives and ABET outcomes.</p>
<p>Action</p>	<p>Faculty Review </p>

CS determines to use formal assessment tools that can measure students' performance in terms of the new ABET criteria. The tools (Survey forms) are developed and the assessment rubrics for the two courses (COSC4319 and COSC4349) are prepared as the self-study tools.

The initial rubrics were applied at the end of Spring 2012 and the revised rubrics and tools for the two courses were used for Fall 2012.

In order to provide accurate assessment and evaluation for students' performance, the assessment results should be collected over multiple semesters and compared. In addition, all the faculty members will share the rubrics and the collected assessment results and improve the CS curriculum/program accordingly

Goal Ethical Principles, Technical Skills, And Management Skills (core)

To develop students' knowledge of ethical principles, technical skills, and management skills relevant to the field of computer science.

Objective (L) Acquisition Of Technical Skill, Management And Ethical Principles

Students will develop and demonstrate knowledge of ethical principles, technical skills, and management skills relevant to the field of computer science.

Indicator ICCP Examination

All undergraduate students must complete CS 437 prior to graduation. Part of the course requirements for CS 437 is to prepare for and take the ICCP Examination. The Institute Certified Computer Professional exam is an exam adopted by the Institute for Certification of Computer Professional (ICCP), the national association in the field of computer science. The exam consists of three sections: ethical principles, technical skills, and management skills. The grading of the three sections is objective grading (i.e., there is no written component to the exam)

Criterion ICCP Exam Performance

The associate level scoring on the exam is between 70% and 85% and professional level scoring is between 86% and 100%. We expect that 70% of graduating seniors taking the exam will pass at or above the associate level.

Finding ICCP Exam

After deliberation the department determined that the ICCP exam was a poor tool for assessment and this indicator will be dropped in future years.

All undergraduate CS students must complete COSC 4319 (Software Engineering) and COSC4349 (Professionalism and Ethics) prior to graduation. In addition, COSC4319, as a capstone course, covers the eight Student Outcomes (except the three outcomes (e), (g) and (h)) out of the eleven Student Outcomes and COSC4349 addresses the remaining three outcomes. Therefore, both the courses are selected for assessment.

To perform a quantitative assessment, the following rubrics for the two courses are developed: (1) rubric for Project, (2) rubric for presentation evaluation, (3) rubric for group member evaluation, and (4) rubric for ethics topics. For COSC4319, faculty members observe students' project presentation and directly evaluated students' performance based upon the rubrics (1)-(3). On the other hand, for COSC4349, students' performance is indirectly evaluated through the exam questions that address rubric (4). Each

category is rated with the following scale values: (1) 1.0 (below expectations or unacceptable), (2) 2.0 (evolving or developing), (3) proficient (or competent), and (4) outstanding (or exemplary). Student's performance on Student Outcomes is directly evaluated with each specific rubric, while the performance on objectives is indirectly measured by mapping between Student Outcomes and Program Objectives.

After the course mapping to the eleven Student Outcomes criteria, CS faculty find the minimum number of courses that will address all the eleven Student Outcomes. As a result, COSC4319 (Software Engineering) and COSC4349 (Professionalism and Ethics) are selected. The assessment result (out of the maximum score of 4) of Program Education Objectives ranges from 2.29 (with std of 1.11) to 3.15 (with std of 0.82) and the assessment score of Student Outcomes ranges from 2.38 (with std of 1.05) to 2.98 (with std of 0.90).

Action

Acquisition Of Technical, Ethical And Management Skills

To improve confidence and significance of analysis results, number of students, different weights for each outcome, and other factors should be considered. For example, if a class has more than 20 (or 25) students, a random sample of 20 (or 25) students could be selected for assessment. Since COSC4319 and COSC4349 do not have the same number of students, the difference in students' needs to be weighted properly. COSC4319 is assessed directly by CS faculty members during students' project presentations based upon the prepared assessment rubrics, while COSC4349 is evaluated indirectly (but objectively) through test/exam questions. Therefore, to have the consistent assessment, the objective assessment for COSC4319 is developed and will be employed from Fall 2012.

Closing the Loops Summary

The first assessment scores on both Program Outcomes and Education Objectives for Spring 2012 is not enough to draw conclusions and/or suggest specific changes to the current curriculum. Therefore, the CS department will obtain more data during Fall 2012 and Spring 2013. Then, based on the analysis result collected at least over two or three consecutive semesters, the current tools and the rubrics will be re-evaluated to customize the curriculum to improve students' performance as well as to meet the ABET-CAC criteria.

In the future, the Program Outcomes and Objectives will be collected with the all the six survey forms and the rubrics for more core CS courses, also including other course activities such as quizzes, assignments, presentations, and exams. Based on the result, the CS undergraduate curriculum committee will plan to share their findings and recommendations to the CS department. Furthermore, CS faculty will discuss those issues with the course instructor(s) for the consistent, repeatable assessment plan and the effective change of the CS curriculum accordingly.

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**Department of Geography
and Geology**





Online Assessment Tracking Database


Sam Houston State University (SHSU)
2011 - 2012


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 66% on a series of specific concept questions embedded in a comprehensive final exam. Students enrolled in GEOG 1321 averaged 73% on a separate, yet similar, series of concept questions. These scores were generally consistent with overall averages on the final exams as a whole.

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 Major Geographic Concepts And Critical Thinking Questions** 
 Students enrolled in GEOG 1301 averaged 68% 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 62% on similar series of questions. Students enrolled in both courses scored lower than expected on questions requiring the interpretation of graphs. Students enrolled GEOG 1301 averaged 51% on such questions, while students enrolled in GEOG 1321 averaged 55%.

Action **Improving Geographical Understanding Of Concepts And Principles** 
 Students enrolled in GEOG 1321 exhibited a satisfactory level of competency in regards to basic geographical concepts, while students enrolled in GEOG 1301 exhibited a degree of competency slightly below that level. In both cases, students generally scored as high on questions pertaining to these concepts as

they did on the exams as a whole. Students enrolled in those two courses scored below a satisfactory level on questions focused upon major geographical concepts and critical thinking. However, average scores suggest that this year's students were more competent with these major concepts than were students from the previous academic year. Despite modest improvement, there remains a need to significantly enhance student knowledge of such concepts. This is especially true in regards to critical thinking. The higher scores exhibited in this area (major geographic concepts and critical thinking) among students enrolled in GEOG 1321 probably represent the smaller class sizes associated with this particular class. In comparison to GEOG 1321, sections of GEOG 1301 (Weather & Climate) enroll larger numbers of students and are offered in large lecture halls. With this in mind, we plan to more strongly incorporate the demonstration of major concepts and critical thinking skills in smaller laboratory sections (GEOG 1101; Weather & Climate Lab). We will also attempt to identify methodologies found to be effective in GEOG 1321 and consider replicating them in other geography courses.

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 an average of 77% on those questions pertaining to the world in spatial terms. Students enrolled in GEOG 1301 scored an average of 68% on questions assessing this concept. Students enrolled in GEOG 1321 scored an average of 67% on those questions pertaining to the concepts of places and regions, while students enrolled in GEOG 1301 scored an average of 65% on questions pertaining to these two concepts. In these two areas (world in spatial terms; places and regions), students generally performed as well as they did on the overall exams as a whole. Students enrolled in both courses scored an average of 60% on questions pertaining to physical systems, which is below the average scores on exams as a whole.

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

While there is certainly room for improvement, results of this assessment suggest that students completing geography courses generally possess a satisfactory ability to utilize maps and other graphical tools. Students performed slightly below a satisfactory level on questions focused on "places and regions." Scores from this year's assessment suggest that students performed less well in this area than was the case in previous years. This very well could reflect the fact that such questions were posed to students enrolled in different classes with varied foci than in earlier years. The area of physical geography students performed least well on pertained to the familiarity with physical systems. We fully expect to enhance student knowledge in this area by offering a new course on Environmental Geography, a course that pending approval should be ready sometime in 2012-2013.

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 and GEOG 1321 scored an average of 76% on a set of questions focused upon human systems. Those same students scored an average of 64% on questions concerning the interaction of the environment and society

Action	Improving Knowledge Of Cultural Aspects Of Geography 🔑
	Results of this assessment suggest that geography students possess adequate knowledge of various aspects of cultural geography, including the knowledge of characteristics, distributions, organizations and movement of human, economic and cultural related phenomena. Student scores on relevant questions assessing these concepts were slightly lower than was the case in the previous academic year, a finding that probably reflects the fact that the questions were incorporated into different classes in the respective years. Students exhibited less than satisfactory knowledge of interactions between the environment and society. Student learning in this area of cultural geography will be significantly enhanced once the new Environmental Geography is offered.

Closing the Loops Summary

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. 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, although student performance in these areas improved considerably from the previous year. 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.

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Sam Houston State University (SHSU)
2011 - 2012

Geology BS

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Goal **Sufficient Knowledge Of Geology To Qualify For A Bachelor Of Science** 🔑
 Students will acquire a comprehensive knowledge of the discipline that encompasses both theoretical and field-based practical skills.

Objective (L) **Successful Completion Of An Externally Evaluated Geology Field Camp** 🔑
 All SHSU Geology majors must attend a six credit, externally evaluated capstone Field Camp as a required component of their degree program. Such field camps are typically open to suitably qualified upper level students from geology programs situated anywhere in the country. They are conventionally evaluated using a letter grade system which the Department of Geography and Geology converted to a ranking system.

SHSU Geology students must be nationally competitive at this capstone task as indicated by at least 60% of our participants achieving at least a Limited Mastery ranking.

Indicator **Successful Completion Of Field Camp** 🔑
 All students must attend a six credit hour Field Camp that is externally evaluated on the following basis: Mastery, Limited Master, Adequate Comprehension, Limited Comprehension, and Very Low Comprehension. Students are free to choose from a very wide range of applicable courses, each of which offers slightly different emphases in terms of geographical location and course structure. ALL courses offer a capstone-like review with Mastery reflecting mastery of taught and examined modules as well as high levels of precision in final field review stand-alone projects. A ranking of Limited Mastery reflects mastery of one or more modules but with some imprecision; a ranking of Adequate Comprehension reflects broad comprehension but demonstrates a lack of sophistication in the use of basic course material; rankings of Low Comprehension and Very Low Comprehension reflect low levels of understanding and effort and indicate inappropriate general preparation prior to field camp participation.

Criterion **60% Of Students Will Achieve At Least A Limited Mastery Ranking By The External Evaluator Of The Field Camp** 🔑
 60% of students will achieve at least a limited mastery ranking or better by the external evaluator of the Field Camp.

Finding **Field Camp Results From External Evaluator** 🔑 🔑
 We requested the University of Missouri Field Camp Director to provide feedback concerning strengths and weaknesses of our students because six of our students attended that camp. His comments are attached. Most summers we only have two or three students attend each camp, so it is not much of a population to work with. 100% of the students achieved limited mastery.

Action **Response To External Evaluation Based On Field Camp Performance** 🔑
 Dr. Joseph Hill will continue to work to improve student abilities in the area of geologic field studies.
 Dr. Hill will have the students do an additional pace and compass exercise in the field so that it is a more rugged and less familiar setting than the campus. He will also introduce the Jacob's staff as a field tool for measuring elevation and stratigraphic thickness.
 Dr. Hill took the students to Arkansas to have them perform a field mapping

exercise. That seems to have improved our student's ability to do field mapping during this year's field camp. We will be returning to that same site this year.

Dr. Hill will be teaching Geology of North America this year, and will emphasize the regional geology in the area where the field camp is located.

Goal	Deliver Core Curriculum Education Appropriate To The Geology Discipline 🔑
	The Department of Geography and Geology provides discipline-specific offerings to the Core Curriculum.

Objective (L)	Apply Basic Components Of Geology 🔑
	Students completing the core curriculum courses will demonstrate an understanding of the basic components of a geological perspective and will recognize geological themes.

Indicator	Core Curriculum Geology Comprehensive Exam 🔑
	All students enrolled in core curriculum geology classes complete a final comprehensive exam related to the foundations of geology.

Criterion	Average Of At Least 75% Accuracy 🔑
	The average score of core curriculum geology students will be at least 75% on the final comprehensive exam.

Finding	Geology Exam 🔑
	The average score was approximately 60%, with a range from 50% to 66% from section to section. Only 51% of students answered the factual knowledge questions correctly, 74% answered the tentative nature of science questions correctly, and 60% appear to understand that nature is governed by physical laws. 43% answered the logical constructs based on factual knowledge questions correctly compared to 73% last year. Only 71% showed an understanding of the logic of science. Only 60% answered the graph interpretation and inference/reasoning questions correctly.

Action	Geology Exam 🔑
	Four areas showed improvement. Understanding that nature is governed by physical laws went from 55% to 60% (compared to 38% the first year). Appreciating the tentative nature of science went from 56% to 74%. An understanding of the logic of science went from 53% to 71%. The primary focus this year was on improving student understanding of graphs by increasing the amount of graph interpretation performed in the labs. The graph interpretation and inference/reasoning score went from 37% to 60%. Still a way to go, but definitely an improvement. The big disappointment was their ability (or inability?) to form logical constructs based on factual knowledge. The scores went from 73% to 43%, which is comparable to the 46% attained the first year. We will have to scrutinize our methodology. Maybe we got lucky last year, but we will need to consider changing or increasing the number of exercises related to this skill. We will also continue to work on graph interpretation skills.

Goal	Development Of A Geologic Knowledge Base 🔑
	Each student is required to have developed a level of knowledge in various areas of

geology prior to attending the capstone geology field course.

Objective (L)**Mineral Recognition** 🔑

After completing Geology 3404, students will be able to recognize minerals.

Every geology student must take Geology 3404, Mineralogy. One of the objectives of this course is to be able to recognize minerals, which is a skill that will be needed when they take the capstone geology field course.

Indicator**Final Mineral Practical Exam** 🔑 🔑

Students completing Geology 3404, Mineralogy, must take a final practical exam that requires the recognition of minerals.

Criterion**Student Scores** 🔑

60 percent of the students will be able to recognize 15 or more of the 30 minerals presented to them on the final mineral practical.

Finding**Mineral Practical Scores** 🔑

A big improvement this year. 74% of the students were able to recognize 15 or more of the 30 minerals presented to them on the final mineral practical (compared to only 13% last year). This is the best performance on this exam for a number of years.

Action**Mineral Practical Performance** 🔑

The instructor spent more time working with students on the fundamentals of mineral recognition. The instructor visited with the students to discuss different strategies that could be used to improve mineral recognition skills. A flow chart method that we discussed last year will be fully implemented during the next mineralogy class. We will continue with a Friday afternoon help session for the Physical Geology lab (GEOL 1103) to improve student's ability to recognize minerals at the freshman level.

Closing the Loops Summary

Many of the field studies weaknesses that were identified last year seemed to have been resolved. The field camp director seems quite pleased with the training students received at SHSU. It is the Geology Program's intention to continue achieving the same level of student preparation. Actually, we are hoping to improve on it by adding a field methods course in 2013-2014. The Form B for the course is making its way through the current curriculum cycle. The general core curriculum courses are undergoing changes in response to the core curriculum revision slated for Fall, 2014. This year we made some headway in some areas, but slid backwards in another area. Therefore, we will be working on improving performance and perhaps expanding the evaluation instrument. Mineral recognition seems to be improving, but we will still be trying some different methods aimed at long term retention.

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**Department of Mathematics
and Statistics**



Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

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	Derivative Results The following problem was included on all calculus finals: Find the derivative of $f(x) = (\sin(e^{2x}))/x^3$ Of the 109 students who took the exam, 78 - 72% provided the correct derivative.
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 Results The following integration problem was included on all calculus finals: Find the definite integral of the function $x^2 + x^{-1/3}$ between 1 and 4. Of the 109 students who took the exam, 67 - 61% were able to evaluate the integral correctly.
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 The following optimization problem was included on all calculus finals: <i>An open box is to be made from a 3 ft. by 8 ft. piece of cardboard by cutting out squares of equal size from the four corners and then bending up the sides. Find the maximum volume of the box.</i> On the final exam, 30 - 28% of 109 students answered the problem correctly.

Action

Actions For 2012-2013

The totals for all three assessments are similar to those done in the two previous assessments, with the exception of the optimization problem. The 28% passing rate is much lower (compared to 45% and 46% in the previous two years).

One new approach was tried this year: two sections in the spring were taught as both writing-enhanced courses and as guided discovery courses. It was our hope that this non-traditional approach, which required much more student interaction, might lead to better results. The two sections were taught by instructors who are very experienced in this technique. Unfortunately, there does not appear to be any significant benefits. Of the 54 students from those two sections, the corresponding percentages are: 72% found the correct derivative, 51% found the correct integral, and 27% did the optimization correctly.

The lack of improvement in the optimization problem is most disappointing.

Faculty attended two on-line homework demonstrations (given by publishing representatives in the spring). We hope to have a couple sections of calculus pilot this idea next year to see if that helps with students' achievement in calculus.

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

Project Assessment

20 projects were submitted, 19 of them received an 8 or better based on the given rubric. None, however, received a perfect grade of 10.

Action

Implications For 2012-2013

In the past, we have used two upper-level classes in our assessment. This was not possible this year. We had hoped to create a joint project with the geometry class and the history of mathematics class, but logistical problems prevented this.

The results from the Geometry class are good, but there is still some concern about whether or not students are grasping the ideas behind proofs. It may be

that next year we will use a different class (or classes) to see if we are meeting our objective.

Closing the Loops Summary

Last year, we indicated we would try to address our lack of success in calculus by having companies provide the department with demonstrations of on-line homework software. Because of scheduling problems, these demonstrations did not take place until the spring. We also had two professors try teaching calculus in a way that required more student interaction and a great deal more written explanation from students. While we did not expect too much of an impact on the skill objectives of differentiation and integration, we did hope there would be some benefit with the applied problem. Sadly, this was not the case - in either the traditional classes or the experimental ones. At this point, we are not sure how we plan to proceed, although we will be meeting with publishers to determine possible alternatives.

As for our upper division classes, assessment over the past two years shows we seem to be meeting our objective - at least for one or two upper-division classes. It is probably time to turn our attention to some of the other upper division classes.

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Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

Mathematics MS

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Goal	Develop Research Skills 🔑 Students who choose to complete a thesis will develop research skills
Objective (L)	Demonstrate Graduate-Level Research Skills 🔑 Students completing the MS with a thesis will demonstrate skills in completing original research.
Indicator	Thesis Defense Rubric 🔑 🔑 The attached rubric will be used to rate student research during the thesis defense.
Criterion	Rating On Thesis Defense Rubric 🔑 MS students choosing to complete a thesis will score either a "fail", "pass" or "high pass" on their thesis based on the given rubric.
Finding	Masters Theses Completed 🔑 For students graduating in May 2012, six successfully completed theses. A seventh student will be completing her thesis in August. Although successful, some students demonstrated inadequate understanding, or at least presentation, of background material relevant to the research topic. Additionally, some had to be prompted by faculty members to correctly answer questions regarding their research.
Action	Increase In Students Doing MS Theses 🔑 Last year, we had only one student complete a MS thesis. The increase in the number of theses this year is partially a result of some of these students getting mathematics research experiences as undergraduates. A second factor may be related to the increase in quality of MS candidates. The thesis committee may want to mentor more closely MA candidates regarding their review of the literature related to the research and encourage practice of the presentation and answering questions.

Goal	Emphasize Written Communication Skills 🔑 The curriculum will provide students with opportunities to develop the skills typically required of professionals in the area of study.
Objective (L)	Communicating Mathematical Ideas-Written 🔑 Students will be able to write rigorous proofs of mathematical statements, read mathematical research manuscripts, write formal mathematical papers, and use critical thinking skills to solve research problems.
Indicator	Comprehensive Examination 🔑 Students in the MS program will take a written comprehensive examination in the areas of abstract algebra, analysis, and topology. The examination will be

scored by a committee of faculty.

Criterion

Examination Criteria

All candidates will receive a mark of either "High Pass" or "Pass" for the Mathematical Statistics component of the comprehensive oral exam.

Finding

Results Of Comprehensive Examinations.

Seven out of eight students passed all of their comprehensive examinations. Five students passed all three exams on their first try, two students needed to retake one exam and passed on the second try. One student still needs to pass her second exam and will re-take the exam this summer.

Of the seven students passing the three exams, there were four occurrences of "high pass". The other 17 exams received "pass." Those passing but with less than "high pass" typically approached the problem correctly but were not as sophisticated in their presentation or background evidence.

Action

Pass Rates For Comprehensive Exams

The pass rate for comprehensive examinations is consistent with the past couple of years. For some particularly strong students, however, the department has given them the option of foregoing a comprehensive exam if the student decides he/she would like to do a thesis. In this case, the student must spend the summer working on a thesis prospectus. If accepted, the comprehensive examinations are waived. It should be pointed out that only very strong students are allowed to pursue this option. For less strong students, the department will work with students to strengthen their examination by integrating background research with a more polished presentation.

Closing the Loops Summary

The mathematics faculty were very pleased with the quality of the theses that were submitted and completed this year. They were not nearly as pleased with the unexpected difficulties put up by the library in accepting the theses' formatting. In short, mathematical researchers use highly-specialized word processing software, LaTeX, which has slightly different formatting options than Microsoft Word. Initially, the library said it would not accept the theses unless they were submitted as Word documents. This was not acceptable to us from a professional standpoint. In the end, a compromise was reached. It is our hope a more permanent understanding of our unique formatting requirements can be worked out.

Whether on thesis defense or comprehensive examination, our students could improve in integrating background research with a more polished proof. Thesis committees can mentor their students in this endeavor. More preparation and instruction will be necessary to assist students sitting for comprehensive examinations in the same areas of integrating background information and a polished presentation of the proof.

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Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

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, and statistical computing).
Indicator	Comprehensive Oral Examination 🔑 🔑 A comprehensive oral examination, given 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 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	Results: Multivariate Analysis 🔑 Seven students received a "pass" in multivariate analysis. A common issue seemed to be lack of a strong knowledge base.
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	Results: Regression Analysis 🔑 Seven students received a "pass" in regression analysis. While there were some small, correctable statistical errors, most candidates displayed an adequate knowledge of the material.
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	Results: Mathematical Statistics 🔑 All seven students received a "high pass" in mathematical statistics.
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: Design Of Experiments

Seven students received a "high pass" in design of experiments.

Action

Summary Of Oral Exam Results.

All seven candidates were able to receive "high pass" or "pass" on their comprehensive examinations. Because students seemed to struggle somewhat in regression and multivariate statistics, the faculty will re-examine the course material. It has not been an issue in the past, so it may well be that this was a one-time occurrence.

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 rating of either "High Pass" or "Pass" by the members of the examining committee during the practicum assessment according to the attached rubric.

Finding

Practicum Assessment

Seven students completed their practicum this academic year. All seven received a "high pass."

Action

Efficacy Of Practicum

The results this year were very encouraging in light of the fact that all of the students doing the practicum this year were international students. They have made great progress in their written and oral English skills.

Closing the Loops Summary

Last year's summary was:

The main goals of the MS program in statistics are to make sure our students have the appropriate knowledge to design statistical experiments and analyze the results and put them in their proper context. This has to be done while using appropriate statistical tools (software) as well as with the ability to explain what has been done. The statistics faculty believes the MS program's emphasis on communication skills and discipline-specific knowledge

provides the students with ample opportunity to demonstrate their competencies. At the moment, the four broad areas of discipline-specific skills are designed to prepare students for jobs in industry or to advance to graduate school. What skill sets may be needed in the future may become a topic for discussion.

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. At this time, the only changes that have been made have been in the suggested MS Stat minor requirements. Students with a graduate minor in statistics are required to take two foundational courses in the theory of probability and statistics, followed by options related to regression, multivariate statistics, and experimental design. This aligns the coursework more closely with the MS Stat majors and should make our students more marketable.

Finally, we will more intensely work with students in the areas of regression and multivariate statistics so that their minor mistakes will be corrected.

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Department of Physics














Online Assessment Tracking Database

Sam Houston State University (SHSU)
2011 - 2012

Physics BS

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Goal	Deliver Core Curriculum Education Appropriate To The Physics Discipline 
	The Department of Physics provides discipline-specific offerings to the Core Curriculum
Objective (L)	Apply Foundational Concepts  Students who complete the core curriculum course in 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	Foundational Concepts Of Physics  The exam is 25 questions with a maximum score of 100. Scores were very similar to last year's scores: pretest average = 16.9 and post-test average = 35.1. Although there was significant learning from pre- to post-test, the average was far from 70%.
Action	Foundations Of Physics  We have proposed a new course, Physics 1401, entitled Physics Boot Camp. The course is designed to improve problem solving skills of incoming freshmen.

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 4371 (Thermal and Statistical Physics) 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 $\frac{1}{4}$ penalty for wrong answers.

Finding

Fundamental Principles - PHY 4371

Pre/Post average = 34/52% with no wrong answer penalty. Thus, our average was above the 74th percentile. We were strong in adapting previous GRE exams to create a comprehensive exam for thermal and statistical physics.

Action

Principles Of Physics

We are pleased with the results of the mock-GRE exam for thermal and statistical physics. The next goal is to expand the same sort of mock-GRE to other areas of physics.

Closing the Loops Summary

In response to our dismal results in the foundations class, we have proposed a Physics Boot Camp course to improve problem solving skills of incoming freshmen. After the success of the mock-GRE exam for thermal and statistical physics, we will be expanding the mock-GRE concept other areas of physics.

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