

2016-2017

College of Science and Engineering Technology

Department of Agricultural Sciences and Engineering Technology

Assessment Plan Summary

Department: Agricultural Business BS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Agricultural Sciences and Engineering Technology, Department of

Agricultural Business BS

1-Develop Professional Marketplace Skills

Goal Description

Students earning a BS in Agribusiness will develop the skills necessary to seek initial job placement as they begin their professional careers.

Related Items/Elements



Learning Objective Description

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

🐞 🚠 1-AGRI 4120- Professional Employment Portfolio

Indicator Description

All students seeking a degree in Agribusiness are required to complete AGRI 4120. The course addresses essential skills necessary for job placement in the work force - resume preparation, interview skills, technical writing skills and employment opportunities. Faculty will review student assignments compiled into a portfolio and assess student performance using a faculty-developed rubric.



Criterion Description

Faculty evaluations expect that at least 70% of the Agribusiness 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.

Findings Description

The instructor of the course chose to report results based on an average score, rather than the proportion of students achieving a 3 or greater on the portfolio this year. We will likely return to the proportion measurement in future assessments.

On average, Agribusiness students (n=30) scored 3.45/5.0 on the standardized

rubric. The portfolio included a cover letter, resume, reference page, letters of recommendation and an employment application. Generally, Agribusiness students performed comparably to previous semesters. However, there is room for improvement.

Strengths:

- · Resumes are well done
- Applications and cover letters are organized and neatly completed

Weaknesses:

 Alignment issues between cover letter, resume, listed references and letters of recommendation need correction

🐞 🎜 1- Development of Marketplace Skills

Action Description

Students are exceeding expectation, but there is room for improvement. Recommendations include to 1) place more attention in class on stressing the importance of "Alignment" in the portfolio and 2) inclusion in the course packet of the importance of selecting references.

2-Framework to Encourage Productive Discussions in Agricultural and Food Policy

Related Items/Elements

2-Development of Framework to Encourage Productive Discussions in Agricultural and Food Policy

Learning Objective Description

Students will take their exposure to agricultural and food policy gained in AGBU 4386-Agriculture and Government Programs, to develop a framework encouraging productive discussions with other segments of society pressing for changes in agricultural policy, in its broadest sense

13. 14. 14. 14. 2. 15. 15. 16. 16. 17. 17. 18. 18. 19.

Indicator Description

All students enrolled in the Agribusiness program as majors must complete AGBU 4386 (some students pursuing the minor in Agribusiness choose to take the course) in their senior year. AGBU 4386 focuses on concepts related to agricultural and food policy, both domestically and internationally. In the course, students are exposed to 1) global food inequities and societal desires to correct them, including trade, 2) the historical progression of U.S. agricultural policy including major legislation and organizational development and 3) the use of economic principles to make informed decisions and recommendations about agricultural policy and programs in a political environment. Evaluation of these competencies is accomplished by reflective writing assignments, analysis/evaluation assignments and a policy paper.

From among the various writing assignments, the policy papers produced by students will be scored using a writing rubric developed at Oklahoma State University. The rubric is based on a 1-5 scale with a 3 (meets expectation), 4 (exceeds expectation) and 5 (far exceeds expectation).

The policy paper is on a topic chosen by the student from the course material. Students are encouraged to identify the topic (more narrowly defined the better) in an introductory statement followed by a brief objective history (i.e, synopsis) of the topic or issue. They are then asked to carefully outline the opposing views with supportive evidence, the view they support and why they support this position. A final summary paragraph is expected. This paper is 1500-1750 words in length excluding word-count on the literature cited page. A minimum of five high quality peer-reviewed sources are required with proper citations using the

http://www.oxfordjournals.org/our_journals/ajae/for_authors/guide.pdf. Internal citations in the narrative must be documented using the Harvard style. Failure to include a literature cited page and/or internal citations will result in a grade of zero (0). If the student fails to meet the minimum number of peer-reviewed sources expected, the highest grade they can earn on the assignment is a 3.

Additionally, students are asked to submit a final reflection addressing the most significant concept learned in this class during the semester and why they consider it so. This document is reviewed to see if a common/dominant theme or themes were identified by students that can be related back to the stated learning competencies.



Criterion Description

Agribusiness faculty agree that at least 80% of students enrolled in AGBU 4386 will perform at a level of 3 (meets expectation) and that 50% of students will achieve a score of at least 4 (exceeds expectation) or higher at assessment of the policy paper described in the indicator description.

Agribusiness faculty will also review the final reflection submitted by students. The most significant self-reported learning by each student will be categorized to determine if a dominant theme or themes emerge that can be tied back to one of the major learning competencies.

Findings Description

This is the initial assessment of a new goal established by the Agribusiness faculty for students enrolled in AGBU 4386- Agriculture and Government Programs. A review of results from all three semesters that the course was taught in 2016-17, only 52% of students (N=66) scored a 3 (meets expectation). Out of this 52%, approximately 50% scored a 4 (exceeds expectation). Therefore, there is considerable room for improvement.

Students were asked to submit a final written reflection identifying the most significant thing they learned in the course. Responses were highly varied among students. Yet, the overall observation was the generally thoughtful nature

in how students approached the concept they chose, indicative of the development of a more balanced view and resulting critical analysis.



Action Description

Since this is the initial assessment of a new goal established by the Agribusiness faculty for students enrolled in AGBU 4386- Agriculture and Government Programs, findings will be evaluated by the faculty to determine next steps. Given that students failed to perform at the expected levels has several possible explanations including lack of technical writing preparation (even though these are senior students and that explicit instructions were given and examples provided). It could also be attributed to failure to follow instructions and/or that this was the first time they had been asked to write a technical paper to develop an opinion, rather than a more traditional informational piece.

We will also look more closely at the final reflective assignment and/or student course evaluation comments to see if major themes emerge about what overarching concepts/ideas students are capturing from the course.

3-Knowledge of Key Disciplinary Concepts and Skills

Goal Description

Students will take the conceptual knowledge and practical skills relevant to Agribusiness gained in the Agribusiness Program and effectively demonstrate there use in the capstone course, AGBU 4375- A Agribusiness Management.

Related Items/Elements

3 M3-Development of Students' Knowledge of Key Disciplinary Concepts and Skills

Learning Objective Description

Students will demonstrate competency in key areas of agribusiness by applying conceptual kn and practical skills gained through their course of instruction. Students, working as part of a tidentify a publicly-traded agribusiness firm and perform the following, 1) investigate and acquappropriate data/information from various legitimate, public sources, 2) conduct an assessmen internal and external environmental data/information, 3) complete a financial analysis of the c from publicly available information and 4) create a strategic plan for the company. Results from final project report developed by student teams will be shared in a professional presentation be peers and faculty.

🐞 🚠 3-AGBU 4375- Agribusiness Capstone, Conceptual Knowledge and Skills Assessmer

Indicator Description

All students enrolled in the Agribusiness program must complete AGBU 4375 in their se AGBU 4375 addresses key concepts and skills relevant to the field of agribusiness and s management. Student teams' assignments from AGBU 4375 will be reviewed by faculty with expertise in the field of agribusiness. Faculty members will score the assignments i

scale of 1 - 5 with 3 "meets expectations," 4 "exceeds expectations," and 5 "far exceeds expectations."



Criterion Description

Agribusiness faculty agree that at least 80% of student teams in AGBU 4375 will perform level of 3, "meets expectations" or higher on the overall final report, with at least 70% so or higher in the technical writing component, a specific weakness identified in previous a periods.

Findings Description

There were 23 students divided into six teams (five four-person teams and one three-pers. Each team acted as a consulting firm performing the strategic analysis of an agribusiness of their choice. The teams developed write-ups in each class, which served as project con. The instructor made edits and provided suggestions on these write-ups. Students address comments and submitted external, internal, financial and strategic analysis. The instructor corrections and provided instructions for improvement on these reports. The teams address comments and compiled the reports into the final project report. The final project report evaluated using the rubric provided.

Most initial write-ups developed in class had considerable issues related to both content technical writing. Technical writing and style were the areas that required considerable improvements. However, because of the continual feedback and edits from the instructor final reports scored 3 or more on average. The weakest area in the final reports was style (references and formatting). More emphasis will be placed on this section in future seme

The evaluation of the final reports of all the teams in Spring 2017 are provided below.

Team 1
Agribusiness Firm: Sanderson Farms

Attribute	Scale					Gr
	1	2	3	4	5	
Internal Company Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptional	4
External Environment Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptional	4
Financial Analysis	3	Incomplete, but with good explanation	Complete, but with poor or no	Complete, but somewhat lacking full	Knowledgeable with Depth of Understanding	

for what is explanation explanation 4 there Strategic Little Understands Knowledgeable Knowledgeable Poor Analysis understanding Concepts with Depth of Understanding **Technical** 1 or more 4 Errors max 2 Errors max No Errors 2 or more writing skills errors per errors per 3 (grammar, page avg. page avg. typo, spelling, etc.) Style Major flaws Minor flaws Good Good Excellent (formatting, in formatting in formatting formatting and formatting and organization and and organization. organization. and references, organization. organization. Less than 3 No errors in etc.) More than Less than 8 Less than 5 errors in references 12 errors in errors in errors in references 4 references references references

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Team 2

Agribusiness Firm: Syngenta AG

Sam Houston State University

Attribute
Scale

Attribute			Scale		
	1	2	3	4	5
Internal Company Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptiona
External Environment Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptiona
Financial Analysis	Missing major components	Incomplete, but with good explanation for what is there		Complete, but somewhat lacking full explanation	Knowledgeal with Depth (Understandin
Strategic Analysis	Poor	Little understanding		Knowledgeable	Knowledgeal with Depth (Understandin
Technical writing skills (grammar, typo, spelling, etc.)	2 or more errors per page avg.	1 or more errors per page avg.	4 Errors max	2 Errors max	No Errors
Style (formatting, organization references, etc.)	and	_	Good formatting and organization. Less than 5 errors in references	Good formatting and organization. Less than 3 errors in references	Excellent formatting an organization No errors in references

Team 3
Agribusiness Firm: The Kroger Company

Attribute			Scale		
	1	2	3	4	5
Internal Company Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptiona
External Environment Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptiona
Financial Analysis	Missing major components	Incomplete, but with good explanation for what is there	_	Complete, but somewhat lacking full explanation	Knowledgeal with Depth (Understandii
Strategic Analysis	Poor	Little understanding		Knowledgeable	Knowledgeal with Depth o Understandii
Technical writing skills (grammar, typo, spelling, etc.)	2 or more errors per page avg.	1 or more errors per page avg.	4 Errors max	2 Errors max	No Errors
Style (formatting, organization references, etc.)	and	_	Good formatting and organization. Less than 5 errors in references	Good formatting and organization. Less than 3 errors in references	Excellent formatting at organization No errors it references

Team 4
Agribusiness Firm: John Deere

Attribute			Scale		
runoute			Seare		
	1	2	3	4	5
Internal Company Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptiona
External Environment Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptiona
Financial Analysis	Missing major components	Incomplete, but with good explanation for what is there		Complete, but somewhat lacking full explanation	Knowledgeal with Depth (Understandii
Strategic Analysis	Poor	Little understanding		Knowledgeable	Knowledgeal with Depth o Understandin
Technical writing skills (grammar, typo, spelling, etc.)	2 or more errors per page avg.	1 or more errors per page avg.	4 Errors max	2 Errors max	No Errors
Style (formatting, organization references, etc.)	Major flaws in formatting and organization. More than 12 errors in references	in formatting and organization.	Good formatting and organization. Less than 5 errors in references	Good formatting and organization. Less than 3 errors in references	Excellent formatting at organization No errors it references

Team 5
Agribusiness Firm: Whole Foods Market

Attribute	Scale			Gr		
	1	2	3	4	5	
Internal Company Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptional	4
External Environment Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptional	4

Financial Analysis	5	but with good explanation	but with	somewhat	Knowledgeable with Depth of Understanding	4
Strategic Analysis	Poor	Little understanding		Knowledgeable	Knowledgeable with Depth of Understanding	4
Technical writing skills (grammar, typo, spelling, etc.)	page avg.	1 or more errors per page avg.	4 Errors max	2 Errors max	No Errors	4
organization	in formatting and organization.	and organization. Less than 8 errors in	formatting and organization.	Good formatting and organization. Less than 3 errors in references	_	2

Team 6
Agribusiness Firm: The J.M. Smucker Company

Attribute			Scale		•	Gr
	1	2	3	4	5	
Internal Company Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptional	3
External Environment Analysis	Missing or seriously lacking	Adequate, with weak explanations	Adequate, with acceptable explanations	Well Developed	Exceptional	4
Financial Analysis	Missing major components	Incomplete, but with good explanation for what is there	Complete, but with poor or no explanation	Complete, but somewhat lacking full explanation	Knowledgeable with Depth of Understanding	4
Strategic Analysis	Poor	Little understanding		Knowledgeable	eKnowledgeable with Depth of Understanding	4
Technical	2 or more	1 or more	4 Errors max	2 Errors max	No Errors	

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4

writing skills	errors per	errors per
(grammar,	page avg.	page avg.
typo,		
spelling, etc.)		

Excellent Style Major flaws Minor flaws Good Good (formatting, in formatting in formatting formatting and formatting and organization and and organization. organization. and references, organization. organization. organization. Less than 3 No errors in references More than Less than 8 Less than 5 errors in etc.) 12 errors in errors in errors in references references references references

The average scores of all teams across the areas are presented in the following Table

	Team 1	Team 2	Team 3	Team 4	Team 5	Team 6	Avg.
Internal	4.2	4.4	4.1	4.5	4	3.8	4.17
External	4.2	4.2	4.5	3.8	4	4.8	4.25
Financial	4.2	4.4	4.3	4.3	4.4	4.6	4.37
Strategic	4.2	4.3	4	4.2	4.1	4.5	4.22
Technical	3.8	4.2	4.5	4.2	4.2	4.4	4.22
Style	4	3.5	4.2	4	2.8	4.3	3.80
Avg.	4.10	4.17	4.27	4.17	3.92	4.40	

🔊 😂-AGBU 4375- Agribusiness Capstone, Conceptual Knowledge and Skills A

Action Description

It is critical to continue the team orientation of this course as most students verthemselves in this type of work environment in their professional careers. To iterative nature of the development of student strategic plans with expert (inseedback is also relatively common in the marketplace. This allows students experience the complexity of the market and how collaboration can generate investigation, results and decision-making compared to acting alone.

As noted earlier, most of the initial write-ups developed in class had considerable issues re content and technical writing. Technical writing and style were the areas that required con improvements. However, because of the continual feedback and edits from the instructor, a reports scored 3 or more on average. The weakest area in final report was style (references a formatting). More emphasis will be placed on this section in future semesters.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

We must be diligent in continuous assessment of the learning objective, "Development of Marketplace Skills" to ensure that students are prepared to enter the marketplace. Students are exceeding expectations, but there is room for improvement. Recommendations from the current course instructor were 1) to pay more attention to stressing the importance of "Alignment" among items in the portfolio and 2) to add to future course expectations the importance of selecting references.

A major change will occur in Fall 2017, when assessment of marketplace skills development for Agribusiness students will begin migration to AGBU 4363- Agribusiness Sales and Consulting.

As it relates to content mastery among students in our capstone course, most students know the content, but had difficulty communicating it in a professional manner. With coaching from the faculty member, improvement occurred. However, style, especially references continued to be an issue. Therefore, more emphasis will be placed on this section in future semesters.

Update of Progress to the Previous Cycle's PCI

Assessment of marketplace skills development for Agribusiness students will migrate to AGBU 4363- Agribusiness Sales and Consulting in fall 2017, which we believe will encourage better alignment with goal assessment.

We will continue to investigate the appropriate manner to assess our students in Agriculture and Government Programs (name change to Agricultural and Food Policy beginning fall 2017) after initiating evaluation in 2016-17.

We are seeing improvement in our students' ability to communicate strategically as they undergo an iterative process with the course instructor (coach), mimicking certain marketplace environments. We will continue to work on style.

Plan for Continuous Improvement

Closing Summary

1. <u>Development of Professional Marketplace Skills - Transition</u>: The Agribusiness faculty engaged in curriculum mapping of the SHSU Agribusiness program in the 2016-17 academic year. After

carefully evaluating topics covered in all courses, it was discovered that a number of the professional development skills covered in AGRI 4120- Professional Career Skills, a required one-hour course, were also covered in AGBU 4363- Ag Sales and Consulting, an elective three-hour course. Subsequently, the Agribusiness faculty discussed ways to achieve the student professional career development goal, while reducing redundancy in course delivery. The Agribusiness faculty proposed eliminating AGRI 4120 for Agribusiness majors and making AGBU 4363 a required course for all Agribusiness majors beginning in Fall 2017. The learning outcomes previously evaluated in AGRI 4120 will now be assessed, along with some additional measures, in AGBU 4363. The proposal was approved unanimously by the Agricultural Sciences and Engineering Technology faculty. The faculty person coordinating AGBU 4363 has partnered with SHSU Career Services in the past on delivery and assessment of professional career development skills. The faculty person engaged SHSU Career Services in Spring 2017 to assess evaluation rubrics for key career development components (e.g., resume). Additionally, conversations occurred regarding opportunities for external evaluation of student career documents by Career Service personnel. Further assessment will occur as the transition begins in Fall 2017.

2. <u>A Framework to Encourage Civil Discussions in an Increasingly Discordant Society</u>: This is a newly identified learning objective. The overarching goal is to see if we are helping students gain

the ability to engage in civil discussions in a thoughtful, educated manner in an increasingly hostile civic environment. Since this is the initial assessment of a new goal established by the Agribusiness faculty for students enrolled in AGBU 4386- Agriculture and Government Programs, findings will be evaluated by the faculty to determine next steps. Students failed to perform at the levels expected, so we will investigate potential reasons why this might be the case. We will also look more closely at the final reflective assignment and/or student course evaluation comments to see if major themes emerge about what overarching concepts/ideas students are capturing from the course.

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3. <u>Development of Students' Technical Writing Skills</u>: Faculty will continue to emphasize technical writing skills across the AGBU curriculum enabling success in the capstone course. Though most of the initial write-ups developed in class had considerable issues related to both content and technical writing, the iterative nature of the development of student strategic plans with expert (instructor) feedback was helpful to students. The continual feedback and edits from the instructor moved all final reports to an average score exceeding 3 or more on average. The weakest area in final report was style (references and formatting). More emphasis will be placed on this section in future semesters.

Assessment Plan Summary
Department: Animal Science BS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Agricultural Sciences and Engineering Technology, Department of

Animal Science BS

1-Develop Professional Marketplace Skills

Goal Description

Students earning a BS in Animal Science will develop the skills necessary to seek initial job placement as they begin their professional careers.

Related Items/Elements



Learning Objective Description

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

🐞 🚠 1-AGRI 4120- Professional Employment Portfolio

Indicator Description

All students seeking a degree in Animal Science are required to complete AGRI 4120 in their senior year. The course addresses essential skills necessary for job placement in the work force - resume preparation, interview skills, technical writing skills and employment opportunities. Faculty will review student assignments compiled into a portfolio and assess student performance using a faculty-developed rubric.



Criterion Description

Faculty evaluations will indicate that at least 70% of the Animal Science students enrolled in AGRI 4120 will perform at an acceptable level and score a 3 (meets expectations) or higher on a scale of 1-5.

Findings Description

The instructor of the course chose to report results based on an average score, rather than the proportion of students achieving a 3 or greater on the portfolio this year. We will likely return to the proportion measurement in future

assessments.

On average, Animal Science students (n=28) scored 4.38/5.0 ("exceeding expectations") on the standardized rubric. The portfolio included a cover letter, resume, reference page, letters of recommendation and an employment application. Generally, Animal Science students performed comparably to previous semesters. Though ANSC students performed well, there is always room for improvement.

Strengths:

- Resumes were of good quality and well organized
- Cover letters and attention to proper grammar, etc. were largely good

Weaknesses:

 Alignment between reference page and letters of reference needs to be reinforced



Action Description

Students are exceeding expectation, but there is room for improvement. Recommendations include to 1) pay more attention to stressing the importance of "Alignment" among items in the portfolio and 2) stressing the importance of selecting references will be added to course expectations in the future.

2-Knowledge of Key Disciplinary Concepts and Skills

Goal Description

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

Related Items/Elements

🐞 🎮 2-Development of Student Knowledge in Animal Science

Learning Objective Description

Students will develop factual and fundamental knowledge relative to the science of farm animals. Upon completion of the course, students will be able to apply the gained factual and fundamental knowledge relative to animal science and apply the information regarding animal nutrition and management.

🐞 🚣 2-ANSC 3373- Advanced Animal Science Knowledge

Indicator Description

All students enrolled in the Animal Science program must complete an advanced animal science course. The course for assessment (ANSC 3373) addresses key concepts relevant to nutrition and management relative to the field of animal

science and knowledge expected for animal science graduates. During the fall and spring semesters, 398 relative questions were developed and were apart of the 4 exams offered each semester. Questions were classified as factual knowledge, fundamental knowledge and application of both factual and fundamental knowledge. All students were assessed for each category of questions across all exams. Student scores (Fall: 75; Spring: 78) were then categorized on a scale of 1 - 5 with 3 "meets expectations," 4 "exceeds expectations," and 5 "far exceeds expectations."

Criterion Description

There will be a general consensus among Animal Science Faculty members that at least 70% of the students enrolled in the advanced course will perform at an acceptable level with a score of 3 (meets expectations) or higher, in all three categories (factual, fundamental and application). Weaknesses to be observed: application of knowledge.

Findings Description

Though 70.76% of the students in the class scored 3 or higher on the the three categories of embedded questions which met the faculty's goal, this is lower than the previous year. Students scored the highest on factual knowledge for the gastrointestinal tract and carbohydrate exams; yet could not apply the information. Whereas, factual knowledge scores from the water/protein and lipid exams were the lowest. Students could apply their water/protein knowledge as indicated by higher scores but scored highest on fundamental knowledge questions when questioned about lipids. More enriched lectures with practical scenarios will continue to be embedded in the lectures to strengthen the application knowledge and establish a better balance between factual, fundamental and application of knowledge.

🖏 🌊 2- Student Knowledge in Animal Science

Action Description

Though 70.76% of the students in the class scored 3 or higher on the the three categories of embedded questions which met the faculty's goal, this is lower than the previous year. Students scored the highest on factual knowledge for the gastrointestinal tract and carbohydrate exams; yet could not apply the information. Whereas, factual knowledge scores from the water/protein and lipid exams were the lowest. Students could apply their water/protein knowledge as indicated by higher scores but scored highest on fundamental knowledge questions when questioned about lipids. More enriched lectures with practical scenarios will continue to be embedded in the lectures to strengthen the application knowledge and establish a better balance between factual, fundamental and application of knowledge.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

Students are exceeding expectations based on the criterion description. This is a positive outcome. Based on these findings, we will continue monitoring student performance on an annual basis. We

must be diligent in continuous assessment of this learning objective to ensure that our students are prepared to enter the marketplace. We may consider moving the criterion description standard to 70% of Animal Science students enrolled in the course scoring a 4 or higher, rather than a 3 or higher, but we believe it is too early to make this change at this point in time.

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Though 76% of the students in the class scored 3 or higher on the three categories of embedded questions in the common animal science course, there is room for improvement. Students scored the highest on factual knowledge of the gastrointestinal tract, but failed to translate this knowledge into application at the level expected. More supplemental information and enriched lectures with practical scenarios will be embedded to the lectures to enrich the application of factual and fundamental knowledge of GI tract topics. Application of information of carbohydrates was equally low, faculty will spend more time on metabolism how it is affected by the diet.

Update of Progress to the Previous Cycle's PCI

Students have demonstrated the ability to memorize factual knowledge and they have exhibited an acceptable level of fundamental animal science content; however, their ability to apply the information to a higher level of expectations for an advanced course the students are less successful. Faculty in the animal sciences will continue to strive to bridge the students ability to apply information from their core animal sciences into practical scenarios. This will be achieved by discussion, homework, and applicable scenarios across the animal science curriculum. Likewise, faculty will review the application of knowledge from ANSC 3373 into ANSC 4394 (Animal Feeds and Feeding).

Plan for Continuous Improvement

Closing Summary

- 1. <u>Develop Professional Marketplace Skills</u>: It is imperative that we continue to be diligent in assessment of the learning objective, "Development of Marketplace Skills" to ensure that our students are prepared to enter their career fields. Though students generally exceeded expectations, we will consider adjusting the overall average expectation and/or the percentage exceeding "meet expectations" in future semesters.
- 2. <u>ANSC Content Knowledge</u>: Students are exceeding expectations (minimally) based on the criterion description. Based on these findings, we will continue monitoring student performance on an annual basis. We must be diligent in continuous assessment of this learning objective to ensure that our students are prepared to enter the marketplace with the ability to not only have a knowledge base but be able to apply the knowledge in actual animal agriculture environments. We will continue with the criterion description standard of 70% of Animal Science students enrolled in the course scoring a 3 or higher, rather than moving it to 4 or higher, since the achievement of this expectation seems to be variable between assessment cycles.

Assessment Plan Summary

Department: Construction Management BS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Agricultural Sciences and Engineering Technology, Department of

Construction Management BS

Demonstrate Construction Management Knowledge and Skills

Goal Description

Students will demonstrate knowledge and skills relevant to Construction Management.

Related Items/Elements



Learning Objective Description

Students will be able to demonstrate competency in key areas of Construction Management by successfully displaying skills in an Estimation Course. The Estimation Course serves as a capstone requirement with required skills in construction math, material pricing, bid tabulation, and project scheduling.

🖏 🚣ETEC 4369 Cost Estimation- Knowledge and Skills

Indicator Description

All students enrolled in the program must complete an estimation class, ETEC 4369. The course addresses key concepts and skills relevant to project cost estimation relative to the field of Construction Management. Students are expected to achieve a 2 or higher on a scale of 0-4, with 0=incompetent, 1=marginal competency, 2=proficient, 3=accomplished, 4=mastered. We expect 80% of the students evaluated will score a 2 or higher.

Criterion Description

There is consensus among the ETEC faculty that at least 80% of the students will score 2 or higher on the assessment rubric.

Findings Description

The Fall 2016 course, **ETEC 4369 – ABC Estimating Competition**, was used as a substitute for ETCM 4368 – Cost Estimating of Construction Materials. The course provided students with the opportunity to apply their estimating knowledge to a real-world project. The course had 17 students of which 9 students were construction management majors. From those 17 students, a random sample of 5 students was obtained. An evaluation was made based on their comprehensive final examination grading. The final exam had 4 sections to assess the students' knowledge: basic construction math, pricing, bid tabulation,

and project scheduling.

	Ex	am			
Ι	II	III	IV	Score	Grade
0.875	1.000	0.917	0.500	3.29	В
0.875	1.000	0.833	0.500	3.21	В
0.875	1.000	0.833	0.500	3.21	В
0.875	1.000	0.833	0.500	3.21	В
0.750	1.000	0.667	0.250	2.67	С

Section

- I Basic construction math
- II Pricing including material and work take-off
- III Bid tabulation
- IV Project schedule

An evaluation was made based on the Assessment Rubric for each of the students exams and their ranking is shown below.

Rubric objectives

A	В	C	D	E	F
a	a	a	a	m	m
a	a	a	a	m	m
a	a	a	a	m	m
a	a	a	a	m	m
p	a	a	p	m	m

Weighted Rubric Objectives

0.1	0.2	0.1	0.2	0.3	0.1	
3	3	3	3	4	4	3.1
3	3	3	3	4	4	3.1
3	3	3	3	4	4	3.1
3	3	3	3	4	4	3.1
2	3	3	2	4	4	2.8

Rubric Counts

	A	В	C	D	E	F
m Mastered					5	5
a Accomplished	4	5	5	4		
p Proficient	1			1		
g Marginal						

Evaluation of the objective are as follows:

i incompetent

- Objective "A" had 4 students that were accomplished and 1 as proficient.
- Objective "B" had all 5 students that were accomplished or better.
- Objective "C" had all 5 students that were ranked accomplished.
- Objective "D" had all 1 student ranking as proficient with 4 students ranking as accomplished.
- Objective "E" had all 5 students ranking as mastered.
- Objective "F" had all 5 students ranking as mastered.

Action Description

Four of the five randomly assessed students out of the 17 students enrolled in the ETEC 4369 (Estimating of Construction Materials) scored above 3.0 based on a series of assessment tools. The one student who didn't met the expected scored 2.8. It is expected that future students will achieve at a similar level of described criterion that 80% of students enrolled in the course will score a three or higher score based on the assessment rubric.

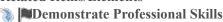
23

Develop Professional Skills

Goal Description

Students will gain necessary work force experience to compete in the construction field.

Related Items/Elements



Learning Objective Description

Students completing the BS in Construction Management will demonstrate skills necessary to compete in the professional marketplace through an internship.

🐌 👬ETEC 4391 Internship Evaluation

Indicator Description

All students enrolled in the program must complete ETEC 4391 in their final year of enrollment. ETEC 4391 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 Description

It is expected that at least 85% of the students enrolled in ETEC 4391 will achieve above average standard (4 or higher) of performance on the supervisor rating scale.

Findings Description

There were five students pursuing the BS in Engineering Technology enrolled in ETEC 4391 in Spring 2017, the semester of assessment. The students completed the assigned weekly reports with a score of 5 on a 5 points scale.

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Action Description

There were 5 student pursuing the BS in Engineering Technology

enrolled in ETEC 4391 during this assessment circle, and earned a score of 5 on a 5 points scale. We will continue monitoring student performance on an annual basis and be diligent in continuous assessment of this learning objective to ensure that our students are prepared to meet the demands of a dynamic marketplace. We consider the current criterion description of 85% of students enrolled in the course scoring a 4 or higher appropriate, and will continue the effort to meet and exceed it.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

We must be diligent in continuous assessment of the learning objective, "Development of Professional Skills" to ensure that our students are well prepared for the dynamic demands of the marketplace. We will continue to meet and exceed the standard description of 80% students scoring above average standard (four or higher).

The randomly assessed five of the 17 students enrolled in the ETEC 4369 (Cost Estimating of Construction Materials) met the criterion description based on a series of course assessment tools. It is expected that future students will achieve at a similar level. We will also discuss the appropriateness to increase the criterion description of 80% of students enrolled in this course from currently scoring two to a three or higher on the assessment rubric.

Update of Progress to the Previous Cycle's PCI

We will continue to assess of the learning objective, "Development of Professional Skills" to ensure that our students are well prepared for the dynamic demands of the marketplace. We will continue to meet and exceed the standard description of 80% students scoring above average standard (four or higher).

Four of the five randomly assessed students out of the 17 students enrolled in the ETEC 4369 (Cost Estimating of Construction Materials) met the criterion description based on a series of course assessment tools with one student scored 2.8. It is expected that future students will achieve at a similar level. We also plan to discuss the appropriateness with the advisory committee to maintain the criterion description of 80% of students enrolled in this course scoring a three or higher on the assessment rubric.

To actively monitor the demands of the market, we plan to outreach and seek feedback from alumni, current and potential future employers. As a first attempt, we will start the process of forming an industrial advisory committee and organizing the first advisory committee meeting in the coming academic year. This effort also prepares the program for the ABET accreditation in the long term.

With the addition of two tenure track faculty, we plan to revisit the current curriculum and check for the prerequisites, course description, and course content. One major topic is to discuss the feasibility of introducing capstone design project as a required major course.

Monitoring market place, skills, and content knowledge

Closing Summary

The Engineering Technology faculty started the process of curriculum mapping as well as

development of flow chart and course offering rotation plan for the SHSU Construction Management program. One major topic is to develop a capstone design project course and incorporate it into the existing curriculum. To achieve this goal, name, prerequisites, course description, and content of all the courses in the current curriculum will be visited and adjustment is necessary to accommodate the additional course hours of the capstone design project course. We plan to solicit input from as many source as possible, particularly industry partner and alumni.

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We will continue to assess the learning objectives of development and demonstration of professional skills to ensure that our students are well prepared for the dynamic demands of the marketplace. We will continue to meet and exceed the standard description of 80% students scoring above average standard (four or higher) for the internship course. We also plan to discuss the appropriateness with the advisory committee to maintain the criterion description of 80% of students enrolled in the cost estimating course scoring a three or higher on the assessment rubric.

Assessment Plan Summary

Department: Interdisciplinary Agriculture BS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Agricultural Sciences and Engineering Technology, Department of

Interdisciplinary Agriculture BS

1-Develop Professional Marketplace Skills

Goal Description

Students earning a BS in Agriculture will develop the skills necessary to seek initial job placement as they begin their professional careers.

Related Items/Elements



Learning Objective Description

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

🔊 🚣1-AGRI 4120- Professional Employment Portfolio

Indicator Description

All students seeking a degree in Agriculture are required to complete AGRI 4120 in their senior year. The course addresses essential skills necessary for job placement in the work force- resume preparation, interview skills, technical writing skills and employment opportunities. Faculty will review student assignments compiled in a portfolio and assess student performance using a faculty-developed rubric.



Criterion Description

Faculty expectations are that at least 70% of the Agriculture 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.

Findings Description

The instructor of the course chose to report results based on an average score, rather than the proportion of students achieving a 3 or greater on the portfolio this year. We will likely return to the proportion measurement in future assessments.

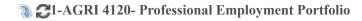
On average, Interdisciplinary Agriculture students (n=6) scored 3.28/5.0 on the standardized rubric. The portfolio included a cover letter, resume, reference page, letters of recommendation and an employment application. Generally, Interdisciplinary Agriculture students performed comparably to previous semesters. However, there is room for improvement.

Strengths:

- Resumes are of good, useful quality
- Job applications are (neatly) completed

Weaknesses:

- Alignment between resume and references
- Letters of recommendation



Action Description

Students are exceeding expectation, but there is room for improvement. The primary recommendation is stressing the importance of selecting references as a component of future course expectations.

2-Knowledge of Key Disciplinary Concepts and Skills

Goal Description

Students will develop knowledge and skills relevant to agriculture.

Related Items/Elements

№2-Development of Students' Knowledge and Skills

Learning Objective Description

Students will be able to demonstrate competency in key areas of professional communication skills through electronic presentations of technical agriculture content. Content knowledge along with writing and oral communications will be important skills assessed.

🐞 🚣 2-ACOM 3360- Student Knowledge and Skills Development

Indicator Description

All students enrolled in the Interdisciplinary Agriculture program must complete ACOM 3360. ACOM 3360 addresses key presentation concepts via electronic media and communication and writing skills of technical content in agriculture. Five presentations of students majoring in Agriculture will be reviewed by faculty members with expertise in the field of agriculture. Faculty members will score the assignments using a scale ranging from 1-10 for specific aspects of the presentation and oral skills with categories of no evidence of achievement,

Criterion Description

Faculty in Agricultural Sciences will assess students' agricultural knowledge enrolled in ACOM 3360 via oral and electronic presentation of technical topics relevant to agriculture. At least 80% of the students will be expected to perform at a level equivalent to adequate evidence or higher as noted on the rubric. Specific focus will be in the areas of clarity, ag/content knowledge and grammar will skills of emphasis as noted from previous review.

Findings Description

Consolidated Outcomes

- General Requirements of Presentation Aid = 5.0/6
- Content of Presentation Aid = 3.5/5
- Grammatical Correctness of Presentation Aid = 4.0/5
- Formatting of Presentation Aid = 6.5/10
- Animation of Presentation Aid = 3.8/5
- Graphics of Presentation Aid = 3.2/4
- Professionalism During Oral Presentation= 4.0/5
- Clarity of Oral Presentation = 2.8/3
- Content and Elaboration During Oral Presentation = 6.2/7

Two of the four students assessed met the 80% goal. Therefore, 50% of the students met the desired student outcomes to 1) create an effective, technically correct presentation aid and 2) demonstrate effective presentation skills.

32-ACOM 3360- Student Knowledge and Skills Development

Action Description

The "Content of Presentation Aid," "Formatting of Presentation Aid" and "Animation of Presentation Aid" sections of the rubric revealed the greatest need for improvement since they were individually below the 80% level. Therefore, more focus will be placed on helping students clearly understand what is correct regarding the presentation aid itself. The oral components of the presentation were all above 80% individually, so students performed satisfactorily in these areas.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

We must be diligent in continuous assessment of the learning objective, "Development of Marketplace Skills" to ensure that our students are prepared to enter the marketplace. We may consider moving the criterion description standard to 70% of Agriculture students enrolled in the course scoring a 4 or higher, rather than a 3 or higher, but we believe it is too early to make this change at this point in time.

Students improved their performance at the expected level in content and skills, with room for improvement on the area of the "Presentation Aid." Therefore, more focus will be placed on helping students clearly understand what is correct regarding how a presentation aid should be used.

Update of Progress to the Previous Cycle's PCI

Assessment instruments indicate that students are prepared and have the necessary tools to begin their initial career search.

Initial results from presentation evaluations note students' oral communication skills exceed expectations, but that clarity regarding the presentation aid needs to be added to improve this component of the assessment process.

Plan for Continuous Improvement

Closing Summary

- 1. <u>Develop Professional Marketplace Skills</u>: It is imperative that we continue to be diligent in assessment of the learning objective, "Development of Marketplace Skills" to ensure that our students are prepared to enter their career fields. Though students generally exceeded expectations, we will consider adjusting the overall average expectation and/or the percentage exceeding "meet expectations" in future semesters.
- 2. <u>ACOM 3360 Student Knowledge and Skills Development</u>: Based on assessment results, course instructors will focus on helping students clearly understand what is correct regarding the presentation aid itself through example and instruction. Student strengths in the oral components of the presentation will be reinforced to maintain/enhance oral communication.

Department of Biological Sciences

Assessment Plan Summary

Department: Biomedical Sciences BS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Biological Sciences, Department of

Biomedical Sciences BS

Effectively Deliver A Core Curriculum

Goal Description

Students will be presented well designed classes to facilitate mastering of the materials identified as a core foundation in biology – Botany, Zoology and Cell Biology

Related Items/Elements



Learning Objective Description

Students will demonstrate a mastery of the core fields in biology: Botany, Zoology, Cell Biology, Microbiology, Genetics and Evolution.

Assessment Exam For Core Classes

Indicator Description

All graduating seniors will take an exiting Biology Assessment Exam (BAE), written by the Biology Faculty. We will analyze the BAE scores from the following areas: botany, zoology, cell biology, microbiology, genetics, evolution to evaluate whether students have a significant level of understanding of each of these fields.

Criterion Description

All Biomedical Sciences majors will be expected to score significantly better than a failing grade in all core areas: botany, zoology, cell biology, microbiology, genetics, evolution.

Findings Description

There are no findings to report for the BAE during the 2016-17 academic year. Although the committee met to discuss developing a new BAE, a new exam was not written and therefore was not administered to the students. The committee will develop a new BAE during the 2017-18 academic year and implement the exam during the new cycle.

Action Description

A departmental committee will develop a new BAE during the 2017-2018 academic year. The chair will deliver the exam and analyze the data during the summer of 2018.

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🐞 🎮 Understanding The Scientific Method And Develop Critical Thinking

Learning Objective Description

Students will demonstrate an understanding of the general nature of scientific knowledge and how scientific knowledge is gained (the scientific method). They also will be able to critically evaluate scientific data to draw informed conclusions.

BAE Analysis

Indicator Description

All graduating seniors will take the Biology Assessment Exam (BAE). We will use BAE exam scores from analytical questions to evaluate a student's understanding of the scientific method and critical thinking.

Criterion Description

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

Findings Description

There are no findings to report for the BAE during the 2016-17 academic year. Although the committee met to discuss developing a new BAE, a new exam was not written and therefore was not administered to the students. The committee will develop a new BAE during the 2017-18 academic year and implement the exam during the new cycle.

🐌 🎜 Develop, implement and analyze BAE

Action Description

A departmental committee will develop a new BAE during the 2017-2018 academic year. The chair will deliver the exam and analyze the data during the summer of 2018.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

After the new exit exam is developed, it will be administered to graduating seniors. We will review the results of this exam each year and we will identify weaknesses in content areas - only content areas related to the biomedical sciences will be reviewed (i.e., Botany, Zoology, Cell Biology, Genetics, Microbiology). We will then convene as a faculty to review these weaknesses and implement strategies for improving success in these areas. This may include changes to curriculum, instructional methods, etc.

Update of Progress to the Previous Cycle's PCI

The undergraduate assessment exam has not been reinstated because the department is still in the process of developing a new test that addresses the criteria all faculty deem as essential and important. A committee will continue to develop this exam and the chair will devise a strategy for administering the exam to graduates.

Revising curriculum based on BAE

Closing Summary

The BAE will be developed by a departmental committee, approved by the faculty and delivered in spring of 2018. The chair will analyze the results and report to the faculty. Following those results the faculty will evaluate the effectiveness of the established goals in the biology curriculum and decide whether alternative curricula should be developed and tested against the standard curricula.

Assessment Plan Summary Department: Biology MS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Biological Sciences, Department of

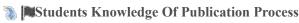
Biology MS

Increase Knowledge Of Profession

Goal Description

Students will gain knowledge of the profession by gaining experience in presenting at scientific conferences and through publication.

Related Items/Elements



Learning Objective Description

Students will be evaluated on their knowledge about the publication process. A test that examines the students knowledge of the profession will be admistered when the student enters graduate school. After they take a course on professional aspects of biology, they will retake the exam. Student progress will be evaluated to examin knowledge of the publication process, etc.

🐌 🚜 Exit Exam

Indicator Description

Students will take an exit exam that asks specific questions about the publication process.

Criterion Description

Scores will be compared to entrance exam. An increase in knowledge about the publication process will be an indicator of success.

Findings Description

There are no findings to report on this KPI, because an exit exam has not been approved by the department and administered to an incoming and exiting cohort of students.

Develop Assessment Exam

Action Description

The graduate committee as charged by the Chair of Biology will

develop an assessment exam designed to evaluate the students academic progress during the course of their MS degree. This exam will be administered at the beginning of the MS degree in the Professional Aspects class and will be re-administered following the completion of degree requirements. Moreover, chair will continue monitor publication rates for students graduating with an MS degree and report those findings to the department.

> APublication Rate

Indicator Description

Each student's publication record will be tracked throughout the MS degree.

Criterion Description

The number of papers published following the MS graduation will be compared to number published when admitted into the program. An increase in publications over this time will indicate the student has learned about the process through direct experience.

Findings Description

The graduating cohort for 2016 consisted of 7 students. Two of these students published during their MS degree, totaling 3 papers.

🔊 🎜 Develop Assessment Exam

Action Description

The graduate committee as charged by the Chair of Biology will develop an assessment exam designed to evaluate the students academic progress during the course of their MS degree. This exam will be administered at the beginning of the MS degree in the Professional Aspects class and will be re-administered following the completion of degree requirements. Moreover, chair will continue monitor publication rates for students graduating with an MS degree and report those findings to the department.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

The Department of Biological Sciences offers a course 'professional aspects' that introduces students to various professional aspects of the field, and faculty mentors are responsible for promoting the publication rates of students. The knowledge of the profession and the publication rate of each graduate student cohort will be tracked over time. Student weaknesses will be identified from this exam and brought to the graduate committee. Changes to the professional aspects course will be made to help address student weaknesses, and strategies will devised to promote publication success of our graduate students.

Update of Progress to the Previous Cycle's PCI

The graduate committee is developing an exam/questionnaire for the first year MS students. They will finalize this exam and seek departmental approval. Once approved, the exam will be

/4

Evaluating Student Skills and Publication Rates

Closing Summary

The results from the exit exam and the publication activities of students will be presented to the Biology faculty. The faculty will discuss the outcomes of these results and develop goals for student achievement. If the faculty decide that student performance needs to be enhanced, they will develop a strategy for achieving these goals.

Department of Chemistry

Assessment Plan Summary Department: Chemistry BS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Chemistry, Department of

Chemistry BS

(1) Deliver A Curriculum Appropriate For Understanding Fundamentals Of Chemistry

Goal Description

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

Related Items/Elements

🐞 🎮 Demonstrate Understanding Of Fundamentals

Learning Objective Description

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.

🐞 🚣 American Chemical Society (ACS) General Chemistry Test

Indicator Description

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 Description

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. In past years, the major

weakness has been the low number of majors who took the exam. We continue to work to motivate more students to take the exam since the biggest problem is the number of takers.

Findings Description

Of the 17 students that took the exam (62 were invited to do so), 14 (82%) scored within one standard deviation of the mean or higher on the ACS standardized general chemistry examination. The criterion was met and exceeded overall. For chemistry majors (excluding forensic chemistry majors), 4 students took the exam (22 were invited to do so) and all 4 of them (100%) scored within one standard deviation of the mean or higher. Thus the criterion was met for the chemistry majors. Overall, the participation rate for the academic year was 17/62 = 27% (and 4/22 = 18% for chemistry majors and 13/40 = 33% for forensic chemistry majors).

We still need to find ways to increase the participation rate.







🔊 🎜 Fundamental Knowledge

Action Description

We think that sitting for the ACS General Chemistry exam for chemistry and forensic chemistry majors as they finish CHEM 1412 (General Chemistry II) is important. We think that the scholarship money should be a reasonable incentive. This year participation is down slightly for the spring semester (24% overall for spring 2017 compared to 27% for spring 2016) and up for the fall (38% which is one of the highest participation rates we have had). It is difficult to generalize and some historical data can be found in the General Chemistry folder (in the file entitled GenChemRecord). While one might expect that multiple offerings of the exam would lead to increased participation, the data don't support it, and there is little to suggest that sending out multiple emails to the students is effective. We will again offer the exam in both the fall and spring semesters, and we will ask all of the CHEM 1412 instructors to encourage the chemistry and forensic chemistry majors in their class to participate.

(2) Deliver A Curriculum Appropriate For Understanding Organic Chemistry

Goal Description

The curriculum will provide students with opportunities to develop the skills typically required of professionals in the area of organic chemistry.

Related Items/Elements

Demonstrate Understanding Of Organic Chemistry

Learning Objective Description

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.

ACS Organic Chemistry Test

Indicator Description

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 Description

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.

Findings Description

In the fall semester, two chemistry majors and ten forensic chemistry majors took the exam. Neither of the chemistry majors (0/2 = 0%) and four of the ten forensic chemistry majors (4/10 = 40%), for a total of four of twelve (33%) overall scored within one standard deviation from the mean or higher for the exam. In the spring semester, twelve chemistry majors and eighteen forensic chemistry majors took the exam. Seven of the chemistry majors (7/12 = 58%) and twelve of the forensic chemistry majors (12/18 = 67%) for a total of 19 of 30 (63%) scored within 1 standard deviation from the mean or higher than one standard deviation above the mean. In total, for these students 7/14 = 50% of the chemistry majors and 16/28 = 57% of the forensic chemistry majors, or 23/42 = 55% overall, met the criterion.

The criterion was not met for either group.



ACSOrganicExam17

OrgChemRecord

Torganic Chemistry

Action Description

For the fifth year in a row, we have data for all of the sections of CHEM 2325 (organic chemistry II) that were taught. Surprisingly, the biggest

correlation with low performance on the standardized exam is no longer the section that fills most quickly when there are multiple sections. In general the fall semester performance is worse than the spring semester performance. This is to be expected since students who are on sequence (and never had to repeat any course) would take this course in the spring. Within the spring offerings, two of the three sections filled at the same time, and the third section filled last. The two that filled fastest had the same instructor, and the section that filled more slowly had a different instructor.

The approaches of these two instructors is different. The instructor teaching two sections used a "flipped classroom" approach and the other instructor did not. For the flipped classroom, 5/8 of the chemistry majors and 11/14 of the forensic chemistry majors met the criteria. In contrast, 2/4 of the chemistry majors and 1/4 of the forensic chemistry majors met the criteria in the traditional class.

We will continue to monitor the situation to see if there are real differences in the approaches. Last year we didn't observe any difference in flipped vs traditional. All of the students who fail to meet the criterion either repeat the course (and subsequently meet the criterion) or they change their majors. We will continue to assess student performance.

(3) Deliver A Curriculum Appropriate For Mastery Of Advanced Chemistry Topics

Goal Description

The curriculum will provide students with opportunities to develop the skills typically required of professionals in the area of advanced chemistry topics.

Related Items/Elements

🐞 🎮 Demonstrate Mastery Of Advanced Topics In Chemistry

Learning Objective Description

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.

🔊 🚣CHEM 4448 Final Examination

Indicator Description

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 Description

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.

Findings Description

The criterion was met with 76% (32/42) of chemistry majors scoring at least 60% on the comprehensive final exam. The full statistics for all semesters since 2004 are attached as well as a box plot of the performance.

Of the 10 who did not make at least 60%, 7 received a grade of F in the course. Their final exam performance was similar to their performance on other exams in the course.

The ten pages of homework per week was not an issue now that the students have come to expect it.



T CHEM 4448 Performance 2004-2016a

FinalExamGradeTrends

🔊 🎜 Physical Chemistry Action

Action Description

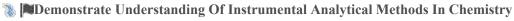
A Lab Manual for CHEM 4448 was successfully completed with the help of two laboratory assistants. It was not published or bound, but the individual chapters/labs were posted on Blackboard each week.

We will continue to move toward publication of the manual in bound form.

Goal Description

The curriculum will provide students with opportunities to develop the skills typically required of professionals in the area of instrumental analytical methods in chemistry.

Related Items/Elements



Learning Objective Description

The modern analytical laboratory makes extensive use of electronic instrumentation for the analysis of chemical samples. Our Instrumental Analytical Chemistry course (CHEM 4440) is designed to introduce students to and have them learn the importance and use of spectrophotometric, chromatographic, and mass spectrometric analytical instrumental methods and computers in analytical laboratories. The course's laboratory component includes a focus on complex technical writing and use of the scientific literature. Students must master this material to meet the objective. While Dr. Thomas Chasteen had been the instructor for all sections of CHEM 4440 for more than a decade, Dr. David Thompson has taken over the class.

🐞 🚣 Examinations In Instrumental Analytical Chemistry

Indicator Description

All students in Instrumental Analytical Chemistry (CHEM 4440) are required to master the electronic, sampling, schematic, and computational fundamentals of modern analytical instrumentation as evaluated by 80-minute written tests requiring essays, laboratory data evaluation, and calculator-based computation. There are three tests and a final examination in this course. The testing of this knowledge and its application is standardized within the department across all sections.

Criterion Description

Eighty two and one half percent of chemistry majors are expected to score within one standard deviation of the mean or higher than one standard deviation above the mean on the four examinations in this class. We expect statistical variability from test to test and from year to year.

Findings Description

On the first exam, 29 of the the 35 students (83%) scored within one standard deviation of the mean or higher. On the second exam, 30 of the 35 students (86%) scored within one standard deviation of the mean or higher. On the third exam, 28 of the 35 students (80%) scored within one standard deviation of the mean or higher. On the final exam, 29 of the 35 students (83%) scored within one standard deviation of the mean or higher. The criterion was met for each exam except the third (which was 2.5% or 1 student short). Clearly intervention is not needed.





Action Description

Dr. Thompson took over the course on short notice, and with good support from Dr. Chasteen began to familiarize himself with how this course has been taught in the past, to develop a vision for its future.

The action for this year will be to begin planning changes in the laboratory that will eventually increase individual student time on the instruments, by running several instruments in parallel during the same lab period. Currently all labs are run serially. This is a major change and the goal this year will be to draw up a strategic plan for making this change, and to recruit one or more students to work over the summer of 2018 testing and developing new labs for this model.

(5) Deliver A Curriculum With Appropriate Written And Oral Communication Skills Developed

Goal Description

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

Related Items/Elements

🐞 🎮 Demonstrate Adequate Written And Oral Communication

Learning Objective Description

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.

🐞 📥 Chemistry Seminar Presentation

Indicator Description

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 Description

All chemistry majors are required to receive an acceptable peer-rating on a required research presentation. Presentations will be deemed suitable if deemed so by the student peer evaluators (as determined by a median score of at least 21 out of 30 points) and by the course professor (assigned score of at least 70 out of 100). Within the course, each student evaluates all other student presentations. The rubric is the last page of the syllabus. Over the years, we have found that peers tended to rate presenters rather highly. We hope to see more helpful feedback after providing additional instruction in constructive feedback.



Findings Description

All students gave presentations that were deemed at least acceptable (100% of 18 in Fall 2016 and 100% of 15 in Spring 2017). Presentations were deemed suitable by the student peer evaluators (as determined by a median score of at least 21 out of 30 points) and by the course professor (assigned score of at least 70 out of 100). (Note: Not all students received the highest grade in the course, as other aspects of the grading rubric were sometimes deficient for an individual student, especially meeting the deadlines for abstract submission).



Action Description

Student presentation quality is acceptable. The professor has transferred some of the techniques used in CHEM5100 to improve student outcomes (rubric-based grading, including review comments on grading rubric, attaching student names to reviews for professor to view then remove) with similar benefits. For the coming year, assessment should focus on the use of literature by the students in their presentations, which has been observed to be weak. Will try requiring students to reference a specific number of related articles in their presentation while still meeting minimum presentation quality standards.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

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

This coming year we will again offer two opportunities to take the ACS exam over general chemistry each semester, but we will endeavor to better advertise it to the students through multiple emails and instructor announcement(s).

In the area of organic chemistry, we will continue to monitor student performance on the standardized final and check instructor and time correlations. This may be a consequence of the registration process--more senior students register first which means that students who did poorly and are repeating the class register first and they may show up disproportionately in the class that fills fastest. As mentioned above, in tracking students who failed to meet the criteria, they do better on repetition. However, not all of them rose to the challenge, and will either have to repeat the course once more, or they will change their major.

In the area of physical chemistry, Dr. Williams will continue to stress issues related to time management through required homework assignments. Difficulties in the laboratory will be addressed through the creation of a Physical Chemistry Laboratory Manual.

In the area of instrumental analysis, there will be a major change in the coming year since the long-time instructor for the course will be taking a medical leave of absence.

For the seminar, there will also be a change in the coming year since the long-time instructor for the course will be taking a medical leave of absence.

I will address one last point. In the meta assessment for this past year, it was implied that the

Sam Houston State University 11/4/2vill46ddress

one last point. In the meta assessment for this past year, it was implied that the Chemistry Department should set some goal--"to be the best Chemistry Department in some specific area of student performance". The curriculum is set by an outside agency. B.S. chemistry majors have exactly one elective course in chemistry. The department is so resource limited that we cannot create and offer new courses. In this environment, we do an incredibly good job at producing students who get jobs in their field or go on to graduate school.

Update of Progress to the Previous Cycle's PCI

Participation rates on the ACS general chemistry exam are up somewhat.

This year saw a shift in student performance in organic chemistry, but one year is anecdotal.

Dr. Thompson took over instrumental analysis and ran the course as Dr. Chasteen would have done.

Dr. Haines took over the undergraduate seminar, and since he has been running the graduate seminar for quite some time, the transition was smooth.

Plan for Continuous Improvement

Closing Summary

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

This coming year we will again offer two opportunities to take the ACS exam over general chemistry each semester, but we will endeavor to better advertise it to the students through instructor announcement(s). Multiple emails appear to have no effect on participation rates.

In the area of organic chemistry, we will continue to monitor student performance on the standardized final and check instructor and time correlations. As previously noted, this may be a consequence of the registration process--more senior students register first which means that students who did poorly and are repeating the class register first and they may show up disproportionately in the class that fills fastest. Demand for the course has increased, and two sections "filled fastest". We hired a new organic chemist this past year, and I expect things will shift as students' opinions shift. Organic chemistry is often the course that convinces some students to change their majors away from chemistry.

In the area of physical chemistry, students are now expecting the required homework, so some of the previous problems have abated. A laboratory manual has been created, but is currently only available online. Dr. Williams will work towards publication of the manual.

In the area of instrumental analysis, now that Dr. Thompson has taught the class once, he will work towards trying to get students to spend more time on specific instruments through creation of a rotating laboratory schedule. This may require more experienced laboratory instructors than we have available.

For the seminar, Dr. Haines has taken over the course and has determined that the students need to pay more attention to proper citation of the primary literature and will focus on improving this area in the next year.

As mentioned previously, there has been a suggestion that the Chemistry Department should set some goal--"to be the best Chemistry Department in some specific area of student performance". The curriculum is set by an outside agency. B.S. chemistry majors have exactly one elective course in chemistry. The department is so resource-limited that we cannot create and offer new courses. If

we were to strive, for example, to be the best department in Texas in teaching physical chemistry, it means that we would have to hire several new faculty to do so and buy a lot of expensive laboratory equipment, which isn't going to happen. We don't have the resources to hire even one additional faculty member. In this environment, we do an incredibly good job at producing students who get jobs in their field or go on to graduate school.

Assessment Plan Summary Department: Chemistry MS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Chemistry, Department of

Chemistry MS

Deliver A Curriculum With Appropriate Discipline Specific Knowledge

Goal Description

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

Related Items/Elements

™Demonstrate Advanced Biochemistry Knowledge And Skills

Learning Objective Description

CHEM 5372 "Advanced Biochemistry I" addresses detailed biochemistry concepts from a chemical perspective. It covers all major macromolecules, but with a strong focus on enzymes using cytochrome P450s as the model enzyme to explore in detail. Students are expected to understand enzymes and how they are studied at a level that allows critical analysis of primary literature in this field.

Ability To Understand And Critically Analyze Primary Literature In Enzyme Biochemistry

Indicator Description

Each student will present an appropriate literature article (selected by the student and approved by the instructor). On the final exam, each student will be required to answer questions on five (5) different papers discussed during the semester (out of 13 total). Each question will require the student to first summarize the paper's major findings, then to explain how a technique used in the paper works, then critically evaluate what the authors did not include in the paper that they should have or could have. The students will not know the nature of the questions before the exam, just that there will be one question for each article.

Criterion Description

Mastery As Demonstrated On Final Exam Questions.

80% of students will score at least 80% (10, 11, or 12 of 12 points) on 80% of the exam questions (4 out of 5 questions each student answered on this section of the final exam). Scoring will be done by the instructor.

Findings Description

Observed Mastery Of Advanced Biochemistry Of Enzymes.

During the Spring 2017 semester, 100% of students (13) met the criteria.



Action Description

This is the second offering where 100% of the students met the criteria. A review of the questions themselves supports that the questions are detailed and rigorous. Further, students are picking diverse questions (they are not doing well as a result of picking a few easier questions). This semester, each exam including the final exam was split into an inclass portion and a take-home portion to allow more in-depth questions to be included (some of which test literature-searching skills as well). In the next offering, I plan to assess the take-home portion as well, as students spend much more time on it and the questions are more indepth.

The property is a second to the Electronic Structure of Metal Complexes (Second Property In the Electronic Structure of Metal

Learning Objective Description

CHEM 5374 "Chemistry of Coordination Compounds" is a course about transition metal complexes. An understanding of the nature of the metal-ligand bond is essential for students to address the rest of the material in the course.

🔊 📥 Mastery of the MO Diagram for Octahedral Metal Complexes

Indicator Description

Graduate students in this course will demonstrate their mastery of the sigma only molecular orbital energy diagram for an octahedral metal complex by constructing such a diagram on an examination given the group theory character tables and the appropriate symmetries of the ligand orbitals.

Criterion Description

Over 90% of the students will score over 3 on a 5 point scale on the question "Draw a full molecular orbital energy diagram for $M(NH_3)_6^{n+}$ where M^{n+} is a transition metal. The symmetries of the lone pairs of ammonia are a_{1g} , e_g and t_{1u} ."

Findings Description

There were six students in the course, and all six scored 5 on this question. Thus 6/6 = 100% scored above a 3.. Thus the criterion was met.

Monitor Student Preparation and Progress

Action Description

With the offering of CHEM 5374 during the fall of 2015, the criterion was not met. Consequently, I gave a "placement" exam on the first day of the offering of CHEM 5374 during the spring of 2017 to assess the students' background. Some were quite weak in this area, so I provided supplemental materials and spent more lecture time on the fundamentals. This approach seems to have worked quite well given the results, so I will do the same again the next time the course is offered.

🐞 🎮 Demonstrate understanding of organometallic bonding and reaction chemistry

Learning Objective Description

CHEM 5375 "Organometallic Chemistry" addresses the principles of bonding and reactivity in organotransition metal compounds and their use in a variety of catalytic transformations. A key objective is to evaluate the mechanisms of complex catalytic reactions in terms of fundamental principles of bonding, and how the reactivity of a catalyst can be understood and controlled using these principles. The relevant principles are the molecular orbitals formed between the transition metal center and organic ligand; the assignment of oxidation states and electron counts; and the relationship between these factors and molecular stability or reactivity.

🐞 🚣 Organometallic Chemistry

Indicator Description

During the final examination, all students in the course will demonstrate their level of mastery of the concepts of organotransition metal bonding by identifying a key bond-forming and bond-breaking reaction step within the complex mechanism for the catalytic hydrodehalogenation of alkenes.

Criterion Description

Over 90% of the students will correctly: identify the oxidative addition step within the multi-step catalytic mechanism and assign the change in oxidation state, electron count, and coordination number that the transition metal center undergoes during this transformation.

Findings Description

100% (10/10) students correctly: identified the oxidative addition step; assigned the change in oxidation state; assigned the change in electron count; and assigned the change in coordination number.

🔊 🎜 Organometallic

Action Description

In future offerings of this course, similar assessment indicators will be used, prompting students to identify a key reaction step within a complex catalytic cycle taken from the literature, and students will be required to evaluate changes in the properties of the transition metal complex that result from this step.

To increase the level of rigor, the criteria will be made more specific, evaluating students' ability to assign the specific values for these properties prior to and after the reaction step, rather than simply the change in these values.

Demonstration of quantitative proficiency in the calibration and validation of chemical sensors

Learning Objective Description

CHEM 5385, "Nanoscience and nanosensing" provides an introduction to calibrated measurements of concentration within the context of nanoscience and nanosensing. The course begins by setting up a framework for calibrated measurements of concentration and then examines how the fabrication, design, function, and applications of nanosensors fit into and influence that framework. Readings are assigned from both textbooks and the primary literature. A key objective of the course is that students be able to quantitatively analyze raw sensor data for the purpose of making calibrated measurements of concentration, and that they be able to validate these measurements.

🐞 🚣 Mastery of sensor calibration and validation concepts

Indicator Description

All students in the course will demonstrate their level of mastery of the concepts of sensor calibration and validation by their performance on a midterm examination devoted to these topics.

Criterion Description

80% of the students will score within 20% of the number of points of the highest scoring student on the relevant midterm exam, provided that the highest score is at least 85% of the available points on the relevant midterm exam. If the highest score is less than 85% of the available points on the relevant midterm exam then the criterion will be that 80% of the students will score greater than 68% of the points on the exam.

Findings Description

The high score was 95% on the fall 2016 relevant midterm. 100% of the students had scores within 20% of this score and thus met the criterion.



Action Description

An additional exercise discussing the potential pitfall matrix effects was added to the course, along with a discussion of how a matrix effect could be identified in the validation procedure. Extra problems from the primary literature were added. This was reflected on midterm exams.

In the next iteration of the course, we will work on developing one or more additional datasets for the students to work up related to ongoing research in nanosensing.

Develop Presentation Skills

Goal Description

The ability to communicate research and knowledge are fundamental presentation skills in chemistry.

Related Items/Elements



Learning Objective Description

Students completing CHEM 5100 will, at least once during their tenure as graduate students, demonstrate the ability to make a research presentation.

™ Acceptable Student Seminar Peer-Reviewed Presentation

Indicator Description

During their tenure as graduate students, all students will present at least one departmental seminar. The faculty, with the assistance of the peer-review evaluation rubric, will determine the presentation's acceptability.

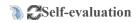
Criterion Description

All graduate students in chemistry are required to take CHEM 5100 at least once during their tenure as graduate students. To pass CHEM 5100, students are required to receive an acceptable peer-rating on a required research presentation. Within the course, each student evaluates all other student presentations. The rubric is the last page of the syllabus.



Findings Description

All students gave presentations that were deemed at least acceptable (100% of 10 in Fall 2016 and 100% of 8 in Spring 2017). Presentations were deemed suitable by the student peer evaluators (as determined by a median score of at least 21 out of 30 points) and by the course professor (assigned score of at least 70 out of 100). The new action, addition of student names to review rubrics that were removed prior to distributing comments to the speakers with a portion of the student grade assigned for review quality (note: grading was changed to rubric grading instead of point-based grading as shown in the syllabus), was a very beneficial change, as comments were observed to be more detailed (the desired outcome) as a result of this change. The post-presentation discussion was enhanced to include discussion of presentation style in addition to research discussions, and this also stimulated additional student interaction and comments and was beneficial.



Action Description

The changes made to CHEM 5100 over the past couple of years should

be kept, and presentation and review quality are both good. Future improvement/assessment should focus on incorporating student self-evaluation.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

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

For the seminar, providing a set time period at the end of the presentation to give the students enough time to provide thoughtful critiques proved to be a problem. The instructor added post-presentation discussion and plans to expand it. He will also make critique-writing a portion of the students' grade.

For CHEM 5381 "Advanced Physical Chemistry: Thermodynamics", the next time the course is offered, the instructor will provide additional tutorial material for students who are struggling with the material or who fall behind. about spectroscopic methods used in enzymatic studies, and the criterion will be raised.

For CHEM 5374 "Chemistry of Coordination Compounds", in the next offering of the course an attempt will be made to assess students' background in this area and will provide supplemental materials for those with weak backgrounds.

For CHEM 5373 "Drug and Toxin Biochemistry" additional graded exercises will be offered. The next time polymer chemistry is offered the students will be required to evaluate and summarize the key points of their peers' presentations.

Update of Progress to the Previous Cycle's PCI

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

Having said that, remarkably one of the courses taught last year was also taught this year: CHEM 5374 "Chemistry of Coordination Compounds". It was determined that some of the students were lacking proper preparation for the course, so additional materials were provided that improved student performance.

Plan for Continuous Improvement

Closing Summary

As pointed out previously, the master's program is different than our undergraduate programs in a variety of ways. Most importantly for assessment purposes, with the exception of our seminar class (CHEM 5100), graduate research (CHEM 6398) and thesis (CHEM 6099), our courses are not typically offered every year. They aren't necessarily offered every other year--the frequency varies based on the instructors' other demands and the need of the students in the program. There are 5 areas of chemistry covered in our program (biochemistry, analytical, inorganic, organic and physical chemistry) and students are required to take at least one course in at least four different areas.

This past year was unusual due to retirements and being short-handed (due to a medical leave of absence) in the sense that CHEM 5374 "Chemistry of Coordination Compounds" was offered during the spring 2017 term (and had been offered in the fall 2015 term). In its next offering, the placement exam will be used again and adjustments made to the course based thereon.

For CHEM 5375 "Organometallic Chemistry", a key reaction step in a complex catalytic cycle will be identified and the level of analysis of this step will be refined in the next offering of the course.

For CHEM 5385 "Nanoscience and nano sensing", the next time this course is offered the instructor will develop one or more additional datasets related to ongoing research in nano sensing.

For CHEM 5372 "Advanced Biochemistry I", in the next offering the instructor will assess the take-home portion of the exams.

For seminar, student self-evaluation will be incorporated.

Department of Computer Science

Assessment Plan Summary
Department: Computing Science BS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Computer Science, Department of

Computing Science BS

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

Goal Description

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

Related Items/Elements

Nanagement And Ethical Principles [Management And Ethical Principles]

Learning Objective Description

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

🐞 🚠 Capstone Project, Ethics Question, And TASO

Indicator Description

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. Additionally, TASO (Test for Assessing Student Outcomes) is implemented to quantitatively measure the eleven SOs. It is required for senior students to take it in senior-level Software Engineering course, prior to graduation regardless of their program concentration.

comparison_from_spring2012_to_spring2017

TASO-assessment_CS_S17

Criterion Description

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 evaluate students' performance based upon the rubrics (1)-(3). One 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.

Questions on TASO are based on topics from a number of required core courses (including COSC 1436, 1437, 2329, 3318, 3319, 4318, 4319, and 4349). Currently, it contains 26 multiple choice questions and 1 short answer question. Each multiple choice question has five choices, including the last choice of "I don't know". The percentage of students who select the correct answer to each given question will be computed and evaluated.

Findings Description

Figure 1 shows this year's assessment results for the 1st and 2nd component compare to prior years, and Figure 2 shows the assessment result for the 3rd component:



Figure 1. Student outcomes assessment (Fall 2016 – Spring 2017)



Figure 1. Student outcomes assessment (Fall 2016 – Spring 2017)

Spring 2017 results are improved from Fall 2016, and close to Fall 2014 based on the assessment score. The ABET committee noticed the score drop when we analyzed the Fall 2016 results, after talking to professors who taught these major courses, we identified the following issues:

- 1. It seems our student quality starts to drop, this is reflected in not only one, but a few major core courses. We have the same professor, using the same difficulty level course material, but the class fail rate increased.
- 2. The 1st component includes faculty evaluations, different faculty has different opinions about what is a good class project. Although we use the same project rubric, the subjective judgment affects the evaluation results.

In addition, from last year's TASO exam results, we noticed there are a few questions below the expected correct rate, especially the questions related to data structure courses (COSC 1436, COSC 1437, and COSC 3319). In Fall 2016, the department UCC committee reviewed the teaching materials of these three courses. Based on the ACM "Curriculum Guidelines for Undergraduate Degree Programs in Computer Science", we investigated whether these three courses have a full coverage of the required Knowledge Area, Knowledge Unit, and topics. We also built a concept map between these three courses, to make sure there are no gap, and not too much overlaps. We also changed some questions in TASO exam to better reflect course contents. As shown in Figure 2, Fall 2016 and Spring 2017 score are improved from Spring 2016 on the modified questions. There are still some questions below the blue line (expected correct

rate). If these continue to be low, we will look at those questions with corresponding course instructors. Furthermore, we posted student presentation videos online, so more faculties can participate in the evaluation, and starting from Fall 2017, we will have three fixed faculty members for the Software Engineering class project evaluation to reduce subjectivity.

There are a few noticeable improvements from the changes we made last year:

- 1. The maximum TASO exam score increased from 73.1/100 to 92.3/100, and the median exam score increased from 55.8/100 to 61.5/100, due to the modification of data structure related questions;
- 2. After reviewing the contents of three data structure courses, we have a clear concept map of which course should cover what topics, not repeating too much contents, and no topics are left untaught;
- We developed and added ABET assessment component to the newly established CSET degree program, and getting one step further to its ABET accreditation;
- 4. The newly joint faculty members have better understanding about the ABET assessment process through trainings/meetings;

COSC 1436/1437 Sequence

Action Description

The department has reviewed the content sequencing for the COSC 1436/1437 sequence and made adjustments. The department will monitor the efficacy of those adjustments.



Action Description

There is concern that a misalignment exists between the objectives of the TASO and the objectives of the Software Engineering course in which the TASO is conducted. There is also concern that the TASO does not adequately reflect performance for students in the Computer Software Engineering program. The Undergraduate Curriculum Committee will examine alternative approaches to conducting TASO.



Performance Objective Description

Each of the components of TASO provides aggregate results on a five point scale for each of the 11 Performance Objectives (PO) and Four Student Learning Objects (SLO) identified as appropriate measurements by ABET/CAC.

For each of the PO's and SLO's an aggregate score above 3.0 represents adequate performance. Aggregate scores above 4.0 represent strong performance.

Specialized Competencies

Goal Description

To develop students' skills and knowledge in their concentration areas. The department offers three concentration areas: Computer Science, Information Systems, and Information Assurance.

Related Items/Elements



Learning Objective Description

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.

Taculty Review

Indicator Description

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 the students' performances across the 18 hours course sequence for each concentration.

Criterion Description

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.

TASO

Performance Objective Description

Each of the components of TASO provides aggregate results on a five point scale for each of the 11 Performance Objectives (PO) and Four Student Learning Objects (SLO) identified as appropriate measurements by ABET/CAC.

For each of the PO's and SLO's an aggregate score above 3.0 represents adequate performance. Aggregate scores above 4.0 represent strong performance.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

The Curriculum Committee has expressed some concerns over content coverage in COSC 1436/1437/3319. This should be reviewed in the upcoming cycle.

The Curriculum Committee is concerned about aligning assessment between Computing Science

and Software Engineering Technology. This also should be reviewed, with recommendations for implementation in the next cycle.

Update of Progress to the Previous Cycle's PCI

A review of content in CS1436/1437 was conducted during summer 2017 resulting in a redivision of content across the two courses, with:

- Object Oriented Programming
- User Interfaces
- command line compilation

being moved from 1437 to 1436, and

• working with Unix-based systems added to 1437.

Alignment of assessment practices is under review by the Undergraduate Curriculum Committee.

Plan for Continuous Improvement

Closing Summary

- Performance in the newly revised COSC 1436/1437 sequence will be monitored
- Alignment of assessment practices between Computing Science and Computer Software Engineering technology will be reviewed.

Assessment Plan Summary

Department: Computer Software Engineering Technology BS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Computer Science, Department of

Computer Software Engineering Technology BS

Ethical Principles And Management Skills

Goal Description

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

Related Items/Elements

🔊 🎮 Ethical Principles And Management Skills

Learning Objective Description

Students will develop and demonstrate an understanding of the ethic considerations and management principles relevant to the field of Computer Software Engineering Technology.



Indicator Description

The Curriculum Committees will be asked to review curriculum for all undergraduate programs. The committees will issue annual reports to be distributed at department meetings.

Criterion Description

The Chair of the Undergraduate and Graduate Curriculum Committees will report discussion, recommendations and actions on an annual basis.

Findings Description

The curriculum committee documents demonstrate that the faculty are actively engaged in reflection on the the curriculum, its relevance to ABET and ACM curricular guidelines, and student performance. The Curriculum committees are reporting on a semi-annual basis, meeting the established criteria.

- 160907 UCC MeetingMinutes
- 170125_UCC_MeetingMinutes
- 170419_UCC_MeetingMinutes
- 2015_11_05_UCC
- 2016_02_03_UCC



Action Description

There is concern that a misalignment exists between the objectives of the TASO and the objectives of the Software Engineering course in which the TASO is conducted. There is also concern that the TASO does not adequately reflect performance for students in the Computer Software Engineering program. The Undergraduate Curriculum Committee will examine alternative approaches to conducting TASO.



Indicator Description

All undergraduate Computer Software Engineering Technology students must complete COSC4349 (Professionalism and Ethics) prior to graduation. COSC4349 addresses three of the eleven identified student outcomes. Additionally, TASO (Test for Assessing Student Outcomes) is implemented to quantitatively measure these Student Outcomes.

- TASO-assessment_S16
- TASO-assessment_spring2017-CSET-FIXED

Criterion Description

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 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.

Findings Description

From a general computer science student performance perspective, the TASO and Ethics exam are producing results that indicate that students are performing at an appropriate level. The quality of data, and the longevity of the data samples indicate that performance over multiple years is relatively stable. There are, however, still areas that could be improved.

Many questions produce results that are below the expected correct rate. One reason may be that this is the first time we have offered the TASO exam to CSET students. They are not familiar with the exam format. A second reason is majority of students in this program are international students from Turkey, who took some of these major core courses from their old school, which may have different course curriculum. In addition, the ethics exam is typical administered during their junior, rather than senior year, at a point where their English Language skills have not be fully developed.

It is still too early to analyze the results of CSET due to limited data we collected, we will continue to monitor and strive to have a better student success rate.

There is misalignment between the assessment criteria in the TASO and the course objectives in the Software Engineering course, where the TASO is administered. The undergraduate curriculum committee has been tasked with resolving this.



Action Description

There is concern that a misalignment exists between the objectives of the TASO and the objectives of the Software Engineering course in which the TASO is conducted. There is also concern that the TASO does not adequately reflect performance for students in the Computer Software Engineering program. The Undergraduate Curriculum Committee will examine alternative approaches to conducting TASO.

™Technical Competence

Learning Objective Description

Students will develop and demonstrate knowledge of technical skills, relevant to the field of computer software engieering technology.

🐌 🚣 Curriculum

Indicator Description

The Curriculum Committees will be asked to review curriculum for all undergraduate programs. The committees will issue annual reports to be distributed at department meetings.

Criterion Description

The Chair of the Undergraduate and Graduate Curriculum Committees will report discussion, recommendations and actions on an annual basis.

Findings Description

The curriculum committee documents demonstrate that the faculty are actively

engaged in reflection on the the curriculum, its relevance to ABET and ACM curricular guidelines, and student performance. The Curriculum committees are reporting on a semi-annual basis, meeting the established criteria.

160907 UCC MeetingMinutes

170125_UCC_MeetingMinutes

170419_UCC_MeetingMinutes

2015_11_05_UCC

2016_02_03_UCC



Action Description

There is concern that a misalignment exists between the objectives of the TASO and the objectives of the Software Engineering course in which the TASO is conducted. There is also concern that the TASO does not adequately reflect performance for students in the Computer Software Engineering program. The Undergraduate Curriculum Committee will examine alternative approaches to conducting TASO.



Indicator Description

All undergraduate Computer Software Engineering Technology students must complete COSC4349 (Professionalism and Ethics) prior to graduation. COSC4349 addresses three of the eleven identified student outcomes. Additionally, TASO (Test for Assessing Student Outcomes) is implemented to quantitatively measure these Student Outcomes.

TASO-assessment_S16

TASO-assessment_spring2017-CSET-FIXED

Criterion Description

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 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.

Findings Description

From a general computer science student performance perspective, the TASO and Ethics exam are producing results that indicate that students are performing at an appropriate level. The quality of data, and the longevity of the data samples indicate that performance over multiple years is relatively stable. There are,

however, still areas that could be improved.

Many questions produce results that are below the expected correct rate. One reason may be that this is the first time we have offered the TASO exam to CSET students. They are not familiar with the exam format. A second reason is majority of students in this program are international students from Turkey, who took some of these major core courses from their old school, which may have different course curriculum. In addition, the ethics exam is typical administered during their junior, rather than senior year, at a point where their English Language skills have not be fully developed.

It is still too early to analyze the results of CSET due to limited data we collected, we will continue to monitor and strive to have a better student success rate.

There is misalignment between the assessment criteria in the TASO and the course objectives in the Software Engineering course, where the TASO is administered. The undergraduate curriculum committee has been tasked with resolving this.



Action Description

There is concern that a misalignment exists between the objectives of the TASO and the objectives of the Software Engineering course in which the TASO is conducted. There is also concern that the TASO does not adequately reflect performance for students in the Computer Software Engineering program. The Undergraduate Curriculum Committee will examine alternative approaches to conducting TASO.



Performance Objective Description

Each of the components of TASO provides aggregate results on a five point scale for each of the 11 Performance Objectives (PO) and Four Student Learning Objects (SLO) identified as appropriate measurements by ABET/CAC.

For each of the PO's and SLO's an aggregate score above 3.0 represents adequate performance. Aggregate scores above 4.0 represent strong performance.

Students will have a strong technical foundation, i.e., students will develop and demonstrate knowledge of theoretical materials, and computational and technical skills in the areas of Computer Software Engineering Technology.

Related Items/Elements



Learning Objective Description

Students will develop and demonstrate knowledge of technical skills, relevant to the field of computer software engieering technology.



Indicator Description

The Curriculum Committees will be asked to review curriculum for all undergraduate programs. The committees will issue annual reports to be distributed at department meetings.

Criterion Description

The Chair of the Undergraduate and Graduate Curriculum Committees will report discussion, recommendations and actions on an annual basis.

Findings Description

The curriculum committee documents demonstrate that the faculty are actively engaged in reflection on the the curriculum, its relevance to ABET and ACM curricular guidelines, and student performance. The Curriculum committees are reporting on a semi-annual basis, meeting the established criteria.

- 160907_UCC_MeetingMinutes
- 170125_UCC_MeetingMinutes
- 170419 UCC MeetingMinutes
- 2015_11_05_UCC
- 2016 02 03 UCC



Action Description

There is concern that a misalignment exists between the objectives of the TASO and the objectives of the Software Engineering course in which the TASO is conducted. There is also concern that the TASO does not adequately reflect performance for students in the Computer Software Engineering program. The Undergraduate Curriculum Committee will examine alternative approaches to conducting TASO.



Indicator Description

All undergraduate Computer Software Engineering Technology students must complete COSC4349 (Professionalism and Ethics) prior to graduation.

COSC4349 addresses three of the eleven identified student outcomes. Additionally, TASO (Test for Assessing Student Outcomes) is implemented to quantitatively measure these Student Outcomes.

TASO-assessment_S16

TASO-assessment_spring2017-CSET-FIXED

Criterion Description

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 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.

Findings Description

From a general computer science student performance perspective, the TASO and Ethics exam are producing results that indicate that students are performing at an appropriate level. The quality of data, and the longevity of the data samples indicate that performance over multiple years is relatively stable. There are, however, still areas that could be improved.

Many questions produce results that are below the expected correct rate. One reason may be that this is the first time we have offered the TASO exam to CSET students. They are not familiar with the exam format. A second reason is majority of students in this program are international students from Turkey, who took some of these major core courses from their old school, which may have different course curriculum. In addition, the ethics exam is typical administered during their junior, rather than senior year, at a point where their English Language skills have not be fully developed.

It is still too early to analyze the results of CSET due to limited data we collected, we will continue to monitor and strive to have a better student success rate.

There is misalignment between the assessment criteria in the TASO and the course objectives in the Software Engineering course, where the TASO is administered. The undergraduate curriculum committee has been tasked with resolving this.



Action Description

There is concern that a misalignment exists between the objectives of the TASO and the objectives of the Software Engineering course in which the TASO is conducted. There is also concern that the TASO does not adequately reflect performance for students in the Computer Software Engineering program. The Undergraduate Curriculum Committee will examine alternative approaches to conducting TASO.

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Performance Objective Description

Each of the components of TASO provides aggregate results on a five point scale for each of the 11 Performance Objectives (PO) and Four Student Learning Objects (SLO) identified as appropriate measurements by ABET/CAC.

For each of the PO's and SLO's an aggregate score above 3.0 represents adequate performance. Aggregate scores above 4.0 represent strong performance.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

The primary area of concern is ensuring the accreditability of the Computer Software Engineering Technology program. This has two components:

- alignment with ABET Body of Knowledge for Engineering Technology programs
- assessment alignment to satisfy ABET requirements and existing assessment in the Computing Science program.

The Undergraduate Curriculum Committee will work on these two issues in the 2016/17 cycle.

Update of Progress to the Previous Cycle's PCI

The Undergraduate Curriculum Committee has discussed approaches to assessment to

- align with other undergraduate programs in the department
- meet the accreditation requirements for ABET/TAC.

Plans have been established to be implemented in the 2017/8 cycle.

Plan for Continuous Improvement

Closing Summary

The Computer Software Engineering Technology program is a new program with one year of successful graduates.

The performance assessment of the program is aligned with performance assessment for other

undergraduate programs. For the most part it works with the following caveats:

- students take the Ethics course in their Junior year rather than their Senior year. Ethics assessment is therefore conducted one year earlier for CSET students than for others, potentially leading to poorer performance.
- one students take the Software Engineering course in their sophomore year rather than their senior year, again potentially leading to poorer performance.

The undergraduate curriculum committee has been tasked with adjusting the timing of assessment to address these problems.

Assessment Plan Summary
Department: Digital Forensics MS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Computer Science, Department of

Digital Forensics MS

Technical Competence - To Develop And Demonstrate Knowledge Of Theoretical Materials, And Computational And Technical Skills

Goal Description

Graduates with a master degree in digital forensics will have a strong technical foundation, that is, to develop and demonstrate knowledge of theoretical materials, and computational and technical skills in the areas of digital forensics.

Related Items/Elements



Learning Objective Description

Students will develop and demonstrate knowledge of theoretical materials, technical skills and project management relevant to digital forensics.

🔊 🚠 Final Capstone Project

Indicator Description

The final project in this degree program is a capstone project that involves the students identifying a significant application development need for a selected client and the design and implementation of an appropriate solution to that need.

Each student is assigned to a member of the graduate faculty among graduate faculty as project advisor together with two additional graduate faculty forming the student's committee.

The department has established procedures for managing projects including

- 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.

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.

Criterion Description

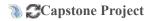
Members of the student's project committee evaluate the written documentation and oral defense of the capstone project with regard to:

- Appropriate scoping of the work at a level expected of a graduate student
- Comprehensive written documentation of the project identifying purpose, development design, completeness, results and potential for future development.

Students are awarded a High Pass, Pass or Fail.

Findings Description

4 students completed their capstone projects with 4 high passes.



Action Description

The capstone project requires two semesters to complete, one semester for planning and one semester for implementation. Currently students are only able to register for one 3-hour course. The Graduate Curriculum Committee will explore more flexible options including:

- additional coursework in lieu of the capstone course
- addition credit hours for the capstone course
- a thesis option

% AWritten Comprehensive Examination

Indicator Description

Each student is required to take and pass the written comprehensive examination (WCE) in the graduating semester. Passing grade is defined as scoring 70 or above out of 100, and high pass grade is defined as scoring 85 or above out of 100. Graduate faculty who teach the current 5 core courses of digital forensics are responsible to design exam questions. Each student is given one hour on each of the 5 subjects:

- 1. Digital Security
- 2. Digital Forensics Investigation
- 3. File System Forensics
- 4. Network and Cyber Forensics
- 5. Cyber Law

Faculty who gave the exam questions are responsible to grade and report grades of these exams.



Criterion Description

Graduate faculty who gave the exam questions are responsible for grading and reporting the grades to graduate advisor. Each exam score should be numeric number between 0 and 100, so that a fail (69 or below), pass (70-84), or high pass (85-100) can be determined.



Action Description

The Graduate Curriculum Committee will develop a plan to provide more flexibility to students with differing career goals that allows for the waiving of comprehensive examination requirements for students who have excelled in some or all of the core courses in the program.

Napply Knowledge And Skills In Projects And Real Work Environments

Performance Objective Description

Students will practice and demonstrate their capabilities and skills relevant to digital forensics and investigation in projects similating real world tasks.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

Graduate programs in the department of Computer Science do not currently have systems in place to track alumni professional performance. This is an issue that needs to be addressed in all three existing graduate programs. The Graduate Curriculum Committee will develop the following in the 2016/17 cycle:

- 1.A rubric to provide a quantitative measure of student performance on comprehensive examinations.
- 2.A rubric to provide quantitative and qualitative data on student performance in final projects/theses.
- 3. Tools to provide comparisons of performance on comprehensive examinations, final projects/theses, and course grades.
- 4. Tools to track alumni career growth over the long term.

Update of Progress to the Previous Cycle's PCI

The following has been achieved:

- A rubric has been established to provide quantitative measures of student performance on comprehensive examinations
- A rubric has been established to provide quantitative and qualitative data on student performance in projects/theses
- A database has been developed to maintain contact with alumni and gather data on career growth.

Closing Summary

The policy concerning comprehensive examinations will be reviewed to provide options for waiving the examination for students who have excelled in the course courses.

The Graduate Curriculum Committee will review the potential for a more flexible approach to capstone projects, offering the option of additional coursework in place of the project and the addition of a thesis option for those who want to go on to further academic study.

The Graduate Curriculum Committee will monitor and report on a regular basis, career changes for alumni.

Department of Geography and Geology

Assessment Plan Summary Department: Geography BA

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Geography and Geology, Department of

Geography BA

Demonstrate Knowledge Of Cultural Concepts In Geography

Goal Description

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.

Related Items/Elements



Learning Objective Description

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.

🔊 🚣 Cultural Geography Concepts

Indicator Description

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 Description

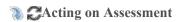
Students will score 70% correct on those questions pertaining to each of the two areas of emphasis associated with cultural geography concepts.

Findings Description

Student Learning Outcomes Concerning Cultural Concepts:

Students enrolled in GEOG 3350 scored an average of 72% on a set of questions focused upon human systems, a score that was slightly higher than realized on the previous assessment. Students enrolled in GEOG 1321 and GEOG 2301 scored an average of 66% and 70% on those same questions. These scores were slightly lower than scores generated from the previous assessment. Students enrolled in GEOG 3350 scored 63% on questions concerning the interaction of

the environment and society, while students enrolled in GEOG 1321 scored an average of 61% on these questions. The scores on these questions were below expectation for both courses, and did decrease slightly from the previous year. Students enrolled in GEOG 2301 scored on average of 70%, a lower score than recognized from the previous assessment, yet still slightly above expectation.



Action Description

The assessment from this year's cycle suggest that student performance on certain basic and major concepts (charts & graphs, statistical procedures, even general concepts) increased when they were addressed in a smaller group settings. For example, student performance improved somewhat among those students enrolled in GEOG 1321 (course with smaller class sizes). They also increased when the concept in question was emphasized in labs associated with larger lecture courses, particularly among students enrolled in GEOG 1401. Thus, in the future we plan to incorporate the teaching of important concepts within breakout sections associated with more of our advanced course offerings. The hope will be that we will ultimately see student improvement across our entire geography curriculum.

As a result of a new faculty hire, an individual possessing expertise in physical/environmental geography, we were able to offer a few additional courses in that subject area of the discipline. Previous assessments have indicated that our students lacked a full understanding of physical systems, although some results from this assessment reflect improvement in this area. We plan to incorporate newly offered physical/environmental geography courses into future assessments, simply as a means to further gage student success in the area of physical systems.

Previous assessments also indicated a weakness among our students in regards to statistical procedures. A slight improvement this past cycle could reflect the inclusion of a statistics course as a degree requirement. However, only a small percentage of students (new majors this past year) have needed to abide by this requirement thus far. We will be paying increasing attention to student outcomes in terms of statistics performance as we move forward, as an increasing number of students should be effected by the requirement in future years.

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

Related Items/Elements



Learning Objective Description

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.

🐌 🚣 Physical Geography Concepts

Indicator Description

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 Description

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

Findings Description

Student Results Concerning Physical Geography Concepts

Students enrolled in GEOG 1321 scored on average 62% on those questions pertaining to the world in spatial terms. Once again this score was both slightly lower than that found on the previous year, and slightly lower than expected. Students enrolled in GEOG 1401 scored on average 60% on questions assessing this concept, less than expected and also lower than that of the previous year. Students enrolled in GEOG 2301 scored on average 72 % on these questions, a score that decreased from the previous year, although it remained higher than expected. Students enrolled in GEOG 2355/2356 (World Regions) scored 64% on these questions. Students enrolled in both GEOG 1321 and GEOG 2301 scored on averaged 70% and 71%, respectively, on questions pertaining to concepts of places and regions. Both scores met expectations, yet are are lower higher than we found the previous year. Students enrolled in GEOG 2355/2356, courses focused specifically on this subject matter, scored 66% on these questions. Students enrolled in GEOG 1401 scored on average 56% on such questions, a significantly lower score than realized previously, and one that failed to meet expectations once again. In those two assessment areas students generally performed as well as they did on exams as a whole. Students enrolled in GEOG 1321 scored 60% on questions pertaining to physical systems, while students enrolled in GEOG 1401 scored 61% on such questions. Both scores were slightly decreased from that of the previous year. Students enrolled in GEOG 2301 scored on average a 77% on these questions.

Acting on Assessment

Action Description

The assessment from this year's cycle suggest that student performance on certain basic and major concepts (charts & graphs, statistical procedures, even general concepts) increased when they were addressed in a smaller group settings. For example, student performance improved somewhat among those students enrolled in GEOG 1321 (course with smaller class sizes). They also increased when the concept in question was emphasized in labs associated with larger lecture courses, particularly among students enrolled in GEOG 1401. Thus, in the future we plan to incorporate the teaching of important concepts within breakout sections associated with more of our advanced course offerings. The

out sections associated with more of our advanced course 79 rings. The hope will be that we will ultimately see student improvement across our entire geography curriculum.

As a result of a new faculty hire, an individual possessing expertise in physical/environmental geography, we were able to offer a few additional courses in that subject area of the discipline. Previous assessments have indicated that our students lacked a full understanding of physical systems, although some results from this assessment reflect improvement in this area. We plan to incorporate newly offered physical/environmental geography courses into future assessments, simply as a means to further gage student success in the area of physical systems.

Previous assessments also indicated a weakness among our students in regards to statistical procedures. A slight improvement this past cycle could reflect the inclusion of a statistics course as a degree requirement. However, only a small percentage of students (new majors this past year) have needed to abide by this requirement thus far. We will be paying increasing attention to student outcomes in terms of statistics performance as we move forward, as an increasing number of students should be effected by the requirement in future years.

NFirst-Year Foundational Geographical Principles And Concepts

Learning Objective Description

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

🐌 🚣Comprehensive Final Exam

Indicator Description

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

Criterion Description

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

Findings Description

Performance On General Geographic Concept Questions:

Students enrolled in GEOG 1401 averaged 59% on a series of specific concept questions embedded in a comprehensive final exam. Students enrolled in GEOG

1321 averaged 69% on a separate, yet very similar, series of concept questions. Students enrolled in world region sections (GEOG 2355 & 2356) were assessed for the first time and averaged 61% on these concepts. As was the case in the previous assessment cycle, scores for GEOG 1401 students were consistent with overall overage scores on the respective final exams, while scores for GEOG 1321 students were slightly higher than final exam averages. Scores for students enrolled in GEOG 2355 or 2356 scored slightly below final exam averages. The scores among students enrolled in GEOG 1401 were slightly lower than those from the previous year. The scores for students enrolled in GEOG 1321, while slightly lower than the previous year, yet were very close to the 70% criterion outlined as a base goal.

Acting on Assessment

Action Description

The assessment from this year's cycle suggest that student performance on certain basic and major concepts (charts & graphs, statistical procedures, even general concepts) increased when they were addressed in a smaller group settings. For example, student performance improved somewhat among those students enrolled in GEOG 1321 (course with smaller class sizes). They also increased when the concept in question was emphasized in labs associated with larger lecture courses, particularly among students enrolled in GEOG 1401. Thus, in the future we plan to incorporate the teaching of important concepts within breakout sections associated with more of our advanced course offerings. The hope will be that we will ultimately see student improvement across our entire geography curriculum.

As a result of a new faculty hire, an individual possessing expertise in physical/environmental geography, we were able to offer a few additional courses in that subject area of the discipline. Previous assessments have indicated that our students lacked a full understanding of physical systems, although some results from this assessment reflect improvement in this area. We plan to incorporate newly offered physical/environmental geography courses into future assessments, simply as a means to further gage student success in the area of physical systems.

Previous assessments also indicated a weakness among our students in regards to statistical procedures. A slight improvement this past cycle could reflect the inclusion of a statistics course as a degree requirement. However, only a small percentage of students (new majors this past year) have needed to abide by this requirement thus far. We will be paying increasing attention to student outcomes in terms of statistics performance as we move forward, as an increasing number of students should be effected by the requirement in future years.

🐞 🚣 Comprehensive Final Exam - Geographic Principles Portion

Indicator Description

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

Criterion Description

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

Findings Description

Performance On Questions Pertaining To Major Geographic Concepts And Critical Thinking:

Students enrolled in GEOG 1401 averaged 64% on a series of questions focused on competency with major principles and critical thinking skills that were embedded in a comprehensive exam. Students enrolled in GEOG 1321 and GEOG 2355/2356 averaged 75% and 65%, respectively, on similar series of questions. In terms of GEOG 1401 and 1321 both cohorts of students this represents a slight improvement from results found from the previous assessment cycle. One notable, albeit minor, improvement when compared to the previous assessment cycle pertains to student scores on questions requiring the interpretation of charts and graphs. Scores among students enrolled in sections of GEOG 1401 demonstrated notable improvement on such questions, although they still performed below the identified 70% criterion. Students enrolled in GEOG 1321 demonstrated slight improvement on these type questions.

Students enrolled in GEOG 1401 averaged 62% on such questions, while students enrolled in GEOG 1321 averaged 71%. Students enrolled in GEOG 2355/2356 averaged 61% on questions pertaining to interpreting charts and graphs. Students enrolled in geography courses once again scored significantly lower than expected on questions requiring the interpretation of basic statistics. Students enrolled in GEOG 1401 averaged 50% on such questions, while those enrolled in GEOG 1321 averaged 62%.

% CActing on Assessment

Action Description

The assessment from this year's cycle suggest that student performance on certain basic and major concepts (charts & graphs, statistical procedures, even general concepts) increased when they were addressed in a smaller group settings. For example, student performance improved somewhat among those students enrolled in GEOG 1321 (course with smaller class sizes). They also increased when the concept in question was emphasized in labs associated with larger lecture courses, particularly among students enrolled in GEOG 1401. Thus, in the future we plan to incorporate the teaching of important concepts within breakout sections associated with more of our advanced course offerings. The

hope will be that we will ultimately see student improvement across our entire geography curriculum.

As a result of a new faculty hire, an individual possessing expertise in physical/environmental geography, we were able to offer a few additional courses in that subject area of the discipline. Previous assessments have indicated that our students lacked a full understanding of physical systems, although some results from this assessment reflect improvement in this area. We plan to incorporate newly offered physical/environmental geography courses into future assessments, simply as a means to further gage student success in the area of physical systems.

Previous assessments also indicated a weakness among our students in regards to statistical procedures. A slight improvement this past cycle could reflect the inclusion of a statistics course as a degree requirement. However, only a small percentage of students (new majors this past year) have needed to abide by this requirement thus far. We will be paying increasing attention to student outcomes in terms of statistics performance as we move forward, as an increasing number of students should be effected by the requirement in future years.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

Based on the assessment of 2015-2016, it would appear that we have slightly improved our teaching of both basic and major geographical concepts, but only in certain areas and/or only among students completing a select number of our courses (for example, students in GEOG 1321, 2301 and 3350 generally perform better than students enrolled in GEOG 1401). This dichotomy is almost certainly due to the varied nature of the courses assessed. Weather & Climate (GEOG 1401), a course where students perform less well, is a core curriculum course enrolling large numbers of students from across campus (over 80 students per section). The other courses assessed (GEOG 1321, 2301 and 3350) enroll smaller numbers of students (30 or less), with many of the students enrolled being geography majors. For this reason we plan to continue our efforts to more assertively implement methodologies that seem to work in GEOG 1321 into the smaller "lab" sections of GEOG 1401. It must be noted that this can be a challenge when the lab TAs are undergraduates themselves. That said, students enrolled in 1401 did improve their performance in areas pertaining to both "world in spatial terms" and "interpretation of charts & graphs." Pedagogical methodologies previously utilized in other geography courses (1321 & 2301) to teach these two subject areas were newly implemented in GEOG 1401 labs during this last year. In short, our efforts towards improving the delivery of important concepts in 1401 through the incorporation of methods proven successful in other courses have already proven somewhat successful.

The offering of Environmental Geography (GEOG 2301) has enabled us to effectively teach concepts related to physical systems among our students, a finding overwhelmingly supported by the results of this assessment. Partially due to this recognition, we have arranged to offer a new course specifically focused on Physical Geography. The new course has been approved and will be offered for the first time in Fall 2016 and will be required of all geography majors. The new course will be taught by a newly appointed environmental geography, who in time will offer a number of courses in the sub-area of physical geography. We expect to incorporate the new physical geography course in future assessments, which should enable us to more accurately gage how effective we are at delivering content relate to physical systems.

Our plans to include two additional introductory "regional geography" courses in assessment efforts (GEOG 2355 & 2356) had to be put on hold this past year. The reason for this was that both courses had to be partially redesigned to meet the needs of a host of education majors, many of which are now required to enroll in them in order to complete their degrees. Now that this transition has been made we will be assessing student performances in these courses, specifically when it comes to focusing on the learning pertaining to "world regions." The inclusion of these two courses in assessment efforts will provide a clearer picture of now effective we are at teaching a critical aspect of a geographic education.

Based on previous recognition that students were not performing all that well when it came to basic statistical procedures, we implemented a requirement that all geography majors complete an introductory statistical course. However, as of yet this change has only applied to a few of our new majors. It is our prediction that the impact of this change will not really show up for a few years. This past assessment demonstrated that some of our students improved their performance in this subject area, but not all. Depending on the outcomes of future assessment, there may be a possibility that we deem it necessary to develop our own "in-house statistics course specifically designed for geography majors.

Update of Progress to the Previous Cycle's PCI

Student performance on important geographical concepts, and in terms of the development of geographic skills, have improved somewhat, but this recent assessment reinforces what we've learned from previous assessments - significant levels of improvement have only been realized among students completing a select number of courses (for example, GEOG 1321, 3301, and 3350). Performance within a few classes still have yet to reach the desired level as outlined in the goals we have put forth. We will continue to try implementing teaching strategies proven to be effective in smaller course sections (ex. statistical analysis; interpretation of maps and graphs) into break-out sections within other courses across our curriculum. Moreover, we will also broaden our assessment to include the evaluation of student performance within a number of additional courses. A number of courses discussed in this report have only been assessed for one full year (in some cases, only one semester), so we still don't have a lot of performance data to consider. Some of our newly offered courses (physical geography, hydrology, sustainable development) have only recently been required by a large number of our majors, yet focus directly or indirectly on subject matter that our students have traditionally struggled with. Accordingly, we anticipate having a more clear picture of student performance as we move forward.

field courses. These courses are often temporary (for example, may only be offered once), and all field courses tend to enroll small numbers of students at any given time. Accordingly we have not really assessed such courses in any previous assessment. However, anecdotal evidence suggest that it appears that students who've participated in one or more field courses generally tend to perform better in our other more traditional in-class courses. It is very possible that students who are directly exposed to the geographical study may benefit in ways that translate to overall performance in the classroom. If this proves to be true, it would indicate it might be beneficial to increasingly incorporate field components across the curriculum.

plans for continual improvement

Closing Summary

plans call for increased focus on three things.

First, we plan to continue to monitor performance on material pertaining to identified weaknesses (working with maps, graphs & statistical procedures) in break-out sections of classes. When appropriate we will put more emphasis on teaching these skills in lab sections of larger lecture-based courses. Certain other material will be treated in smaller group settings without non-lab based courses. Our hope is to identify which specific courses work best for the teaching of important geographical material.

Second, we will attempt to identify the performance of students that are enrolling in newly offered courses within the major (physical geography, hydrology), as well as within new degree-specific requirements (Intro to Statistics). The addition of these type courses to the major is still relatively new, so we do not yet have a full grasp at how effective their inclusion have been in terms of enabling us to teach important spatial skills. To a degree, we will need to also monitor the learning outcomes generated from the newly redeveloped world regional courses (2355 & 2356).

Third, we will begin assessing learning outcomes in our summer field courses. These courses have not generally been required of all students, but anecdotal evidence suggests that students have a firm grasp of the "world in spatial terms" upon completion of them. It may very well decide it best to design one or more of these courses as capstone experiences required of all geography majors.

Assessment Plan Summary Department: Geology BS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Geography and Geology, Department of

Geology BS

Goal 1: Basic skills for geology majors

Goal Description

Deliver basic skills that geology majors will need to be successful in their subsequent coursework.

Related Items/Elements

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Learning Objective Description

Students completing the introductory geology courses will demonstrate an understanding of the basic skills required of a geology major to succeed in subsequent coursework.

№ LICF Goal 1 Objective 1: Basic Geology Skills Evaluation

Indicator Description

All students enrolled in Physical Geology complete two practical exams that measure their ability to apply basic geological skills such as observing mineral properties necessary for mineral identification and being able to read maps and make geological interpretations based on map observations. Certain embedded questions, samples, or problems will be evaluated to measure student performance on specific basic skills.

Criterion Description

At least 70% of the students will be able to perform 70% of the required skills in the embedded questions, samples, or problems. The remaining 30% of the students will be able to perform 50% of the required skills.

Findings Description

On the rock and mineral practical we embedded samples where students had to determine mineral cleavage, a basic skill for identifying minerals. We did this again this year to see if there has been any change compared to last year. This is a physical property that students have difficulty observing. 50% of the students were able to determine the mineral cleavage correctly 70% of the time or better. But 25% of the students were able to determine the mineral cleavage less than 50% of the time.

On the rock and mineral practical we also embedded questions where students had to determine the texture of an igneous rock, a basic skill for classifying igneous rocks. We had noticed students having issues with this concept, but wanted to get a quantitative measure of student skill levels. Only 40% of the students were able to determine the appropriate texture correctly 70% of the time or better. But 53% were only able to determine the appropriate texture correctly 50% of the time.

On the map skills practical we embedded questions regarding the use of basic coordinate systems. We had observed that students seem to be having difficulty stating locations using various coordinate systems. Only 26% of the students were able to determine location coordinates correctly 70% of the time or better. 37% were only able to determine the correct coordinates 50% of the time.

On the map skills practical we also embedded questions where students had to make a geological interpretation based on map observations. Students always seem to struggle with this, but we had not previously quantified their struggle. Only 26% of the students were able to make the correct geological interpretation based on map observations 70% of the time or better. 37% were only capable of making the correct geological interpretation 50% of the time.

3 CAction Goal 1 Objective 1: Basic Geology Skills Evaluation

Action Description

We will continue with the embedded question format of evaluating specific basic geology skills in the introductory courses. We will act upon the information obtained from the results to develop better methods of teaching these basic skills. For example, the findings indicate that we may be doing a satisfactory job of communicating the concept of mineral cleavage, but there may be room for improvement. On the other hand we definitely need to develop better means of teaching igneous rock textures and geological interpretations based of map observations. This is a good outcome because we are getting very specific information about what needs to be improved.

Goal 2: Development Of A Geologic Knowledge Base

Goal Description

Each student is required to have developed a level of knowledge above and beyond the basic skills in various areas of geology prior to attending the capstone geology field course.

Related Items/Elements

The Goal 2 Objective 1: Mineral Recognition

Learning Objective Description

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. This requires that the students be familiar with the physical properties of minerals.

🔊 👬ICF Goal 2 Objective 1: Final Mineral Practical Exam

Indicator Description

Students completing Geology 3404, Mineralogy, must take a final practical exam that requires the recognition of minerals. The recognition process requires an understanding of the physical properties of minerals.

Criterion Description

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. This year's exam will serve as a baseline for measuring student success in regard to using the physical properties of minerals in order to identify the mineral correctly.

Findings Description

Overall practical exam results: 52% of the students (12 out of 23) were able to recognize 15 or more of the 30 minerals presented to them on the final mineral practical. Compared to: 2015 = 79%, 2014 = 90%, 2013 = 70%, 2012 = 57%.

We embedded 8 questions on the final mineralogy practical where students had to determine mineral cleavage, a basic skill for identifying minerals. The students correctly determined the cleavage 58.5% of the time on average. Individual minerals ranged from 30% to 87% correctly determined cleavages.

We embedded questions on the final mineralogy practical where students had to provide the mineral formula for the sample they were observing. Knowing the composition of the mineral is useful information when trying to determine the minerals in a rock sample since many minerals in a rock sample will have similar compositions. The students provided the correct formula 55% of the time on average.

Taction Goal 2 Objective 1: Final Mineral Practical Exam

Action Description

We will continue to use a similar approach used in the introductory courses to evaluate very specific skills by using embedded questions in the practical exams. This will help us understand which specific mineral recognition skills are causing the most problems and then we can develop teaching methods to address those problem areas.

Goal 3: Sufficient Knowledge Of Geology To Qualify For A Bachelor Of Science

Goal Description

Students will acquire a comprehensive knowledge of the discipline that encompasses both theoretical and field-based practical skills.

Related Items/Elements

™Goal 3 Objective 1: Successful Completion Of An Externally Evaluated Geology Field Camp

Learning Objective Description

All SHSU Geology majors must attend a six credit, <u>externally evaluated</u> 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.

The state of the s

Indicator Description

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 Description

60% of students will achieve at least a limited mastery ranking or better by the external evaluator of the Field Camp.

Findings Description

This year we had 6 students attending the University of Missouri Branson Field Camp. The feedback from the Director of the field camp was that as a group our students were well prepared and as a group did not have any particular weaknesses.

% CAction Goal 3 Objective 1: Successful Completion of Field Camp

Action Description

Our response to the feedback from students and field camp directors over the past number of years was to develop our own introductory field methods course. That course has now been offered five times, with the most recent three offerings including two faculty members. The feedback from students and field camp directors regarding this course

has been extremely positive. There is not much more we can do to improve the introductory field methods course. However, now we are looking at ways to improve student preparation for the introductory field methods course. So far we have only focused on a few basic geology skills in the introductory geology courses and mineral recognition in the mineralogy course. We plan on expanding on this type of assessment.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

Student performance of important geology skills during summer field camp will continue to be monitored since the field camp course is the capstone course for Geology majors. The introductory field methods course will again be offered during the May minimester, and hopefully with two faculty members again (this was very helpful to students in 2015 and 2016). The new approach to assessing student ability to apply basic geology skills in the introductory courses is providing useful information for improving our instruction of those skills, so we will expand our efforts in that area. In fact, this process of assessing specific skills will be used in GEOL 3404 (Mineralogy) and GEOL 3405 (Petrology) because it is much more informative than just looking at the grade distribution on the final practical. The grade distribution only indicates that we need to improve what we are doing, but there is no indication of how to improve what we are doing. The specific skill results give us an indication of exact areas of weakness so that we know what explanations and/or demonstrations must be improved.

Update of Progress to the Previous Cycle's PCI

Student performance of important geology skills during summer field camp will continue to be monitored since the field camp course is the capstone course for Geology majors. The introductory field methods course will again be offered during the May minimester, and hopefully with two faculty members again (this was very helpful to students in 2015, 2016, and 2017). The new approach to assessing student ability to apply basic geology skills in the introductory courses is providing useful information for improving our instruction of those skills, so we will expand our efforts in that area. In fact, this process of assessing specific skills will be used in GEOL 3404 (Mineralogy) and GEOL 3405 (Petrology) because it is much more informative than just looking at the grade distribution on the final practical. The grade distribution only indicates that we need to improve what we are doing, but there is no indication of how to improve what we are doing. The specific skill results give us an indication of exact areas of weakness so that we know what explanations and/or demonstrations must be improved. This latter part, changes in instruction, is still a work in progress as we try to refine our embedded questions so that they provide a more precise picture of what problems exist in student learning of these basic geology skills.

Plan for Continuous Improvement

Closing Summary

We will continue with the embedded question format of evaluating specific basic geology skills in the introductory courses. We will act upon the information obtained from the results to develop better methods of teaching these basic skills. For example, the findings indicate that we may be doing a satisfactory job of communicating the concept of mineral cleavage, but there may be room for improvement. On the other hand we definitely need to develop better means of teaching igneous rock textures and geological interpretations based of map observations. This is a good outcome because we are getting very specific information about what needs to be improved. With

regard to our advanced courses, we will continue to use a similar approach used in the introductory courses to evaluate very specific skills by using embedded questions in the practical exams. This will help us understand which specific mineral recognition skills are causing the most problems and then we can develop teaching methods to address those problem areas.

Our response to the feedback from students and field camp directors over the past number of years was to develop our own introductory field methods course. That course has now been offered five times, with the most recent three offerings including two faculty members. The feedback from students and field camp directors regarding this course has been extremely positive. There is not much more we can do to improve the introductory field methods course. However, now we are looking at ways to improve student preparation for the introductory field methods course. So far we have only focused on a few basic geology skills in the introductory geology courses and mineral recognition in the mineralogy course. We plan on expanding on this type of assessment.

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Department of Mathematics and Statistics

Assessment Plan Summary
Department: Mathematics BA/BS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Mathematics and Statistics, Department of

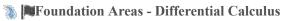
Mathematics BA/BS

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

Goal Description

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

Related Items/Elements



Learning Objective Description

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

🔊 🚣Course Assessment - MATH 1420

Indicator Description

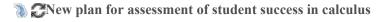
All students enrolled in the program are required to complete Mth 142. Students will be administered a final exam developed and approved by the department faculty. The exam will require them to demonstrate the knowledge and skills mentioned in the objective.

Criterion Description

Common questions on final exams were used to assess student understanding of core concepts from the course. Historically, results were not useful. This criterion is no longer in use.

Findings Description

Data collected was not useful to the department. Another course assessment is in process of being developed.



Action Description

Performance on common questions on final exams gave no valuable information. Instead we should be examining performance in subsequent courses (Calc II, for example) or DFW rates as related to retention of STEM majors.

A plan will be developed over the 2017-2018 academic year.

Deliver An Upper-Level Curriculum With Appropriate Discipline Specific Knowledge

Goal Description

The curriculum will address the discipline specific knowledge dictated by professional societies and/or professionals in the workforce for upper-level instruction in mathematics.

Related Items/Elements



Learning Objective Description

Students preparing to graduate will demonstrate advanced mathematics knowledge and skills.

🔊 🚜 Euclidean Geometry Project - Math 3363

Indicator Description

Students will complete a project on the role of proof and technology in communicating mathematics.

Criterion Description

At the end of the semester, 70% of the students submitting their project will receive a rating of 8 out of 10 or better according to the attached rubric.

Findings Description

More than 70% of the students in MATH 3363 earned 80% or more of the points available in the geometry project.

Continue to use active learning in 3363

Action Description

Because of the success we have seen in this course (which is mandatory for all future secondary math teachers) we will continue to use active learning in this course, MATH 3363. The nature of the material (Euclidean geometry) makes it a natural fit with active learning, increasing student capacity for reading and writing mathematical proofs.

Goal Description

Communicate to our mathematics majors more and better information pertaining to internships, research opportunities, scholarships. etc.

Related Items/Elements

Timprove Communication Between Department And Mathematics Majors

Performance Objective Description

Communicate to our mathematics majors more and better information pertaining to internships, research opportunities, scholarships. etc.

Annual meeting with all math majors

KPI Description

In each late Fall semester, a meeting will be held, hosted by the department chair. All mathematics majors will be invited. This one hour meeting will include an introduction of all faculty in the department (via projected slides), a description of some of the research areas in the department (particularly those that have involved students), and a list of opportunities available to our majors.

These opportunities might involve departmental scholarships and awards, employment opportunities, and conferences available for travel. In addition, we will describe REUs (those both local and external) to the students and encourage students to apply.

The purposes of these meetings are (1.) to inform students of opportunities in the department, (2.) to recruit math majors into our stat minor program, and (3.) to foster a sense of belonging in the department of each one of our mathematics majors.

Results Description

This meeting has increased the number of applications to REU programs and the number of students accepted. This year, K. Tademy was accepted into an REU run by UTEP and Kansas State (or was it UK?)



Action Description

The department will have a new chair in Fall 2017, and she may have new ideas for improving communication between students and faculty.

One challenge will be to recruit students for our new 5-year BS/MS program in mathematics (and presumably later in statistics).

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

The first course any student takes in the BS/BA degree plans is differential calculus (MATH 1420). It is the first encounter we have with our math majors and minors. There are several ways for a student to satisfy prerequisites for this course: MATH 1410 (here), MATH 1314+1316 (here), MATH 1314+1316+2314 (at 2-yr school), high school calculus.... we don't have a firm understanding of how well students are prepared for calculus, and which pathways are or are not effective. We hired a Lecturer (in a 2-year probationary role) to assess these calculus prerequisite pathways. Spring and Summer 2017 will be spent collecting and analyzing data on performance in 1420 based on type of prerequisite obtained. This will be very useful in assessing our precalculus courses.

Update of Progress to the Previous Cycle's PCI

We were successful in opening additional sections of MATH 2440, MATH 4361, and MATH 3377 thanks to the new position we were granted. This has helped relieve some of the pressure on large, upper-level math courses for majors.

Plans for the future, recruiting for a new 5-year BS/MS program

Closing Summary

Plans for the future will be centered around recruiting students for a soon-to-be-approved 5-year BS/MS program. This could help recruit stronger students from "better" high schools, allowing us to compete with A&M, TxTech, UNT, UH, etc.

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We hired a Lecturer (in a 2-year probationary role) to assess these calculus prerequisite pathways. Spring and Summer 2017 will be spent collecting and analyzing data on performance in 1420 based on type of prerequisite obtained. This will be very useful in assessing our precalculus courses.

Assessment Plan Summary Department: Mathematics MS

Sam Houston State University

President, Office of

Academic Affairs, Division of

Science and Engineering Technology, College of

Mathematics and Statistics, Department of

Mathematics MS

Develop Consistent & Stable Cohort Size

Goal Description

A fall cohort of ten supported graduate students allows us to maintain a healthy program with consistent class sizes, class schedules and graduation rates above 7 students per year.

Related Items/Elements

Support Ten New Students Each Year

Performance Objective Description

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

🐌 🖺 Focus on Fall Cohorts

KPI Description

We will focus on strong Fall term cohorts of 10 students. We will rarely allow students to enter during the Spring term. Students will not be allowed to enter in the Summer term.

Results Description

During 2016-17, we brought in nine new graduate students, just one short of our goal.

Recruitment for 2017 and beyond.

Action Description

We plan to continue our goal of recruiting at least 10 new first-year graduate students for each Fall cohort. Recruitment efforts will include targeted recruiting at regional 4-year (no M.S. program) institutions such as TX Southern University and University of Dallas. In addition, we will continue attempting to build a "pipeline" with PhD-granting institutions such as UH and UNT to attract those applicants not ready for their doctoral programs.

We will also continue to serve as aper-doctoral mentoring department through the Math Alliance.

Develop Research Skills

Goal Description

Students who choose to complete a thesis will develop research skills

Related Items/Elements



Learning Objective Description

Students completing the MS with a thesis will demonstrate skills in completing original research.

🐞 🚣 Thesis Defense Rubric

Indicator Description

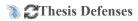
The attached rubric will be used to rate student research during the thesis defense.

Criterion Description

MS students choosing to complete a thesis will score either a "fail", "pass" or "high pass" on their thesis based on the given rubric.

Findings Description

No MS students submitted a thesis in the previous year. Next year, however, may see several theses presented and defended. This rubric will be used.



Action Description

In Fall 2017 and Spring 2018, it is anticipated that three M.S. students will be writing and submitting a thesis. Because of this increase in number over recent years, particular attention will be paid to the quality of these theses and the rubric used to assess the students' defenses.

Naticipation In Colloquia

Learning Objective Description

Faculty will hold a regular colloquium series and graduate students will be encouraged to participate in that series.

🔊 🚣Consistent Colloquium Series

Indicator Description

The Faculty Colloquium series will have 3 or more meetings per month. One or more talks during the school year in the colloquium series will be given by graduate students. At least half of the graduate students will attend that colloquium on a regular basis.

Criterion Description

The faculty colloquium series is a chance for faculty and students (both undergraduate and graduate) tone exposed to mathematics not seen in a traditional classroom. Consequently, a culture of research and exploration is fostered through a healthy colloquium series.

It is also a place for potential faculty hires to present their research to the department for the purpose of making informed hiring decisions.

Findings Description

The faculty colloquium series met at least twice each month, with off weeks hosting a teaching seminar led by faculty.

The early Spring 2017 semester saw 7 invited speakers for job interviews, so "colloquium fatigue" definitely set in. A goal of 3 colloquia each month is perhaps to high.



Action Description

Perhaps because of the renewed interest in weekly colloquia during Fall 2016 and (less so) Spring 2017, we have seen an increase in the number of M.S. students interested in writing a thesis. Therefore, we will continue to foster a robust, active colloquium series each week.

Another reason for the increase in interest of students writing a thesis may be the REU programs we've hosted over the last few years. M.S. students were hired as graduate research assistants over the summer, and often the research done with the undergraduate REU students evolved into a thesis the following year. We will continue to encourage undergraduate research.

Emphasize Written Communication Skills

Goal Description

The curriculum will provide students with opportunities to develop the skills typically required of

professionals in the area of study.

Related Items/Elements



Learning Objective Description

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.

Comprehensive Examination

Indicator Description

Students in the MS program will take a written comprehensive examination in the areas of abstract algebra and analysis. The examination will be scored by a committee of faculty.

Criterion Description

At least two-thirds of our students will pass their comprehensive examinations on their first attempt.

Findings Description

More than two thirds of our MS-Mathematics students passed the comprehensive examination on the first attempt.

Second attempts on Comp. Exams

Action Description

While more than two-thirds of our MS students passed all components of the comprehensive exams on the first attempts, one-third did not. A plan of study for the following semester was created for each of these students, and all passed the exam on their second attempt.

Moving forward, we have allowed some students (the brightest in each class) to petition for an exemption from certain examinations. This allows a student who has excelled in analysis, for example, to concentrate fully on the algebra portion of the exam.

🐞 🎮 Conversation On Teaching

Learning Objective Description

Graduate faculty and graduate students will regularly discuss the teaching profession.

™ Teaching Seminar

Indicator Description

Graduate faculty will lead a teaching seminar with participation from graduate

students. This seminar will meet at least monthly.

Criterion Description

Because many of our MS students will either continue in doctoral programs (which require teaching as part of their graduate assistantships) or as instructors at 2-year schools, quality teacher training is a valuable component of our MS program. Almost all of our tenure-track mathematics faculty regularly experiment in their classrooms with evidence-based, innovative teaching techniques. It would be a shame for the results of the these experiments to not be shared with graduate students.

Findings Description

The teaching seminar was a success, held at least once each month.

The providing even more teacher training for MS students

Action Description

In Fall 2017 and Spring 2018 a new summer bridge course will be offered to incoming undergraduate STEM majors. MS students will have the opportunity to work as teaching assistants in the three weeks preceding each Fall semester. This will provide even more experience with evidence-based, innovative teaching techniques before entering their own classrooms.

🐌 🎮 Students Will Be Proficient At LaTeX

Learning Objective Description

Graduate students will become proficient in the use of LaTeX for mathematical writing.

LaTeX Intensive Courses

Indicator Description

At least one course per semester in our MS-Math program will require LaTeX to be used in the submission of homework assignments. Whenever possible, these submissions will be accepted online using Blackboard.

Criterion Description

LaTeX is the accepted and widely used publishing package used by mathematicians worldwide. Any doctoral student in mathematics will be expected to use LaTeX when writing a dissertation.

Findings Description

LaTeX was required in core graduate algebra and analysis courses in 2017-18.

More courses with LaTeX

Action Description

More M.S. courses will be taught using LaTeX as the preferred submission platform. This will prepare students for PhD programs.

Improve Graduate Student Environment

Goal Description

We will increase and improve the graduate student environment, including office space and quality of office space, desks, tutoring area.

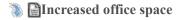
Related Items/Elements



Performance Objective Description

We will increase office space to comfortably handle 20 MS-Math students, each with their own desk and access to personal file cabinets.

Our current office space can currently handle 18 MS-Math students, each with their own desk and personal file cabinet.

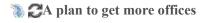


KPI Description

We will attempt to move more of our students and adjunct instructors into the first floor of LDB. This will allow more "elbow room" in the large TA office on the 4th floor.

Results Description

Our attempt at finding more office space on the first floor of LBD failed. Turns out other departments are low on office space as well.



Action Description

In Fall 2018, the Dept. of Biological Sciences will move to their new lab building. This should make all of the 1st floor and part of the 3rd floor available to our department and the Dept. of Geology & Geography. It is unclear who will be moving into the first floor (Nursing? Physics? Computer Science?) but there should be plenty of room on the third floor to be shared with Geology and Geography. It is hoped that we can absorb 4-5 offices or one large room to be used as office space for 8-10 graduate students.

Improve Graduate Student Support

Goal Description

We will increase graduate student support so that our program attacts good students who can study fulltime.

Related Items/Elements

🐌 🛍 Graduate Assistants Should Not Need A Second (Outside) Job

Performance Objective Description

We will increase graduate student support so that students in the program, including international students, can earn \$1000/mo over tuition and fees. This will eliminate the need for our teaching assistant grad students to take a second outside job. (A second job + TA + 3 classes is difficult for domestic students and is illegal for international students.)

KPI Description

We will attempt to convince the new Dean of Graduate Studies that our MS students deserve an increase in salary from \$13,000 to \$18,000. This increased amount in consistent with competitor institutions (UL-Lafayette, for example).

Results Description

We were told by the Dean of Graduate Studies that across-the-board increases in TA salaries will not be granted in the near future. The best way to find money for increases in pay for MS students, according to him, is to utilize distance learning funds.

TA salaries

Action Description

Instead of counting on the university to increase TA salaries, we will instead attempt to supplement the salaries of some TAs with grant funds, REU stipends, etc.

Improve Instruction By TAs

Goal Description

We will improve our instructional support for TA instruction in 1000-level classrooms.

Related Items/Elements



Learning Objective Description

Graduate faculty and graduate students will regularly discuss the teaching profession.

🐌 🚠 Teaching Seminar

Indicator Description

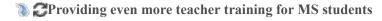
Graduate faculty will lead a teaching seminar with participation from graduate students. This seminar will meet at least monthly.

Criterion Description

Because many of our MS students will either continue in doctoral programs (which require teaching as part of their graduate assistantships) or as instructors at 2-year schools, quality teacher training is a valuable component of our MS program. Almost all of our tenure-track mathematics faculty regularly experiment in their classrooms with evidence-based, innovative teaching techniques. It would be a shame for the results of the these experiments to not be shared with graduate students.

Findings Description

The teaching seminar was a success, held at least once each month.



Action Description

In Fall 2017 and Spring 2018 a new summer bridge course will be offered to incoming undergraduate STEM majors. MS students will have the opportunity to work as teaching assistants in the three weeks preceding each Fall semester. This will provide even more experience with evidence-based, innovative teaching techniques before entering their own classrooms.

🐞 🍽 Participation In Colloquia

Learning Objective Description

Faculty will hold a regular colloquium series and graduate students will be encouraged to participate in that series.

% AConsistent Colloquium Series

Indicator Description

The Faculty Colloquium series will have 3 or more meetings per month. One or more talks during the school year in the colloquium series will be given by graduate students. At least half of the graduate students will attend that colloquium on a regular basis.

Criterion Description

The faculty colloquium series is a chance for faculty and students (both undergraduate and graduate) tone exposed to mathematics not seen in a traditional classroom. Consequently, a culture of research and exploration is fostered through a healthy colloquium series.

It is also a place for potential faculty hires to present their research to the department for the purpose of making informed hiring decisions.

Findings Description

The faculty colloquium series met at least twice each month, with off weeks hosting a teaching seminar led by faculty.

The early Spring 2017 semester saw 7 invited speakers for job interviews, so "colloquium fatigue" definitely set in. A goal of 3 colloquia each month is perhaps to high.

SMaintain momentum with colloquium series

Action Description

Perhaps because of the renewed interest in weekly colloquia during Fall 2016 and (less so) Spring 2017, we have seen an increase in the number of M.S. students interested in writing a thesis. Therefore, we will continue to foster a robust, active colloquium series each week.

Another reason for the increase in interest of students writing a thesis may be the REU programs we've hosted over the last few years. M.S. students were hired as graduate research assistants over the summer, and often the research done with the undergraduate REU students evolved into a thesis the following year. We will continue to encourage undergraduate research.

Mentoring Of 1000-level Instructors

Performance Objective Description

We will actively mentor graduate students teaching 1000-level classes.

Each graduate student that teaches a 1000-level course is now paired with a tenured faculty member who either is teaching the same course or has recently taught that course. This faculty member serves as a teaching mentor for the student throughout the semester.

Consistent mentoring program for teaching TAs

KPI Description

Plan for TAs who will be teaching:

Semester 1: assigned to grading for an instructor, plus tutoring hours in ASC

Semester 2: assigned as a TA for a specific course, attends class regularly

Semester 3: assigned to teach one section of course observed in Semester 2, with faculty mentor

Semester 4: assigned to teach one (or two) sections of that same course, less mentoring necessary

Results Description

Currently between year 1 and year 2 of the plan described in the KPI. So far, so good. Those TAs with more teaching experience (as former high school teachers, for example) were given courses to teach on their own during their third semester.

🔊 🎜Continue plan described in the KPI

Action Description

Everything looks good so far... we are happy with the performance of our 2nd year graduate students who are teaching courses.

🐌 🖊 Stable Teaching Program

Performance Objective Description

We will develop a consistent and stable teaching schedule and program for TAs teaching 1000 level classes.

We are currently assigning each TA who has earned at least 18 hours of graduate credit a teaching assignment of one 1000 level course per semester.

🐞 🖺Consistent mentoring program for teaching TAs

KPI Description

Plan for TAs who will be teaching:

Semester 1: assigned to grading for an instructor, plus tutoring hours in ASC

Semester 2: assigned as a TA for a specific course, attends class regularly

Semester 3: assigned to teach one section of course observed in Semester 2, with faculty mentor

Semester 4: assigned to teach one (or two) sections of that same course, less mentoring necessary

Results Description

Currently between year 1 and year 2 of the plan described in the KPI. So far, so good. Those TAs with more teaching experience (as former high school teachers, for example) were given courses to teach on their own during their third semester.

Continue plan described in the KPI

Action Description

Everything looks good so far... we are happy with the performance of our 2nd year graduate students who are teaching courses.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify)

We are happy with the growth we've seen in the MS-Math program. We have 7 new students each year (5 are needed to sustain a program) but would like 10. We have made sure our students get

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needed to sustain a program) but would like 10. We have made sure our students get enough research experience and LaTeX exposure. We need to rely less on international students and more on external (federal) funding.

Update of Progress to the Previous Cycle's PCI

We've seen an increase in new MS students (7 last year, 9 this year). We are hoping to receive more federal funding to help ease the financial burden of our MS students.

Plans for 2017-18

Closing Summary

We plan on the following:

- -- submitting proposals for external funding to help assist MS students with financial burdens
- -- relying less on international students and more on domestic students for new TA positions
- -- recruiting heavily for the new 5-year BS/MS program. This would decrease the number of full-time MS students who require 2 years to earn an MS degree.