Meta-assessment Analysis Report for the

College of Sciences

Please return the completed report back to the Office of Academic

Planning and Assessment by **February 27, 2015**.

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Assessment is an important best-practice in higher education that helps programs determine whether key objectives are being met, identify areas for improvement, and develop actions to improve program effectiveness. Additionally, meaningful and effective assessment is the corner stone of many discipline-specific accreditations, as well as our University's regional accrediting body, the Southern Association of Colleges and Schools Commission on Colleges. Meta-assessment is an important tool for helping ensure that all programs at Sam Houston State University are engaging in a meaningful and effective continuous improvement assessment process.

Meta-assessment serves two important roles for the College and the University. First, it provides valuable feedback to units regarding ways in which they may continue to improve their annual assessment processes. Second, it provides College and University leaders with a way to observe the overall quality of assessment processes for their units. The purpose of this report is to detail the Meta-assessment process utilized by the College of Sciences, the College's plan for distributing the completed Meta-assessment rubrics to their departments and programs, the assessment strengths observed within the reviewed assessment plans, the areas for improvement of assessment practices, the strategies for implementing those improvements, and the training or resources needed to implement those strategies.

Section 1: Description of Meta-assessment Methodology Employed by the College
Detail the College's Meta-assessment methodology and process. Include a description of who was involved (e.g., a committee of senior faculty or college administrators), your methodology for evaluating unit-level assessment plans, steps for ensuring reliability, and your timeline.

Using the rubric developed by the Office of Academic Planning and Assessment, Dr. Marcus Gillespie, Associate Dean of Assessment and Curriculum in the College of Sciences and Associate Professor in the Department of Geography and Geology, and Dr. Chad Hargrave, Chair of the Department of Biology, each evaluated half of the programs in their college. Both Dr. Gillespie and Dr. Hargrave had the relevant qualifications to conduct the assessments because both participated in the meta-assessment that was done the previous year, and both had been trained in the use of the rubric. In addition, both have used the OATDB system in which the assessment data from each department is entered.

The assessments were done between December 2014 and February 2015. Dr. Hargrave and Dr. Gillespie did not evaluate their own departments. In most cases, they evaluated all of the programs within the departments assigned to them with the goal of ensuring consistency. The only exception involved the Department of Agriculture and Industrial Technology. In the case of this department, Dr. Gillespie evaluated the agricultural programs and Dr. Hargrave evaluated the Industrial programs.

Dr. Gillespie prepared a summary data sheet (Appendix B) showing the scores received on each aspect of the rubric, for each program in a department, as well as the cumulative average of the scores for each department and for the college as a whole. The scores were obtained by

converting the standards on the rubric to a numerical score; specifically; "Developing = 1; "Acceptable" = 2, and "Exemplary" = 3. With the understanding that the conversion of a qualitative score to a quasi-numerical scale is not ideal, it is nonetheless the case that the use of a numerical score makes comparisons, summations, and trends easier to interpret. The rubrics which were returned to the Department Chairs contained written feedback in addition to scores.

As discussed in Section 5, an improved process involving members from each department will be put into place for the next meta-assessment cycle. The new procedure will ensure that more than one person reviews each program by requiring that at least two people from each program participate in the process.

Section 2: Plan for Distributing Completed Rubrics to Units
Detail the College's plan for sharing the completed meta-assessment rubrics with its departments and programs.

The rubrics, the departmental scores, and cumulative college scores were returned to the respective departments to be used by the Chairs and other members of the departments for purposes of revising and guiding future assessment strategies. This information was e-mailed to the Chairs. As discussed in Section 5, new procedures will be put into place to ensure an improved approach to the conveyance of results to the departments.

Section 3: Observed Strengths within College Assessment Plans
Detail the general strengths identified by the College after reviewing its units' assessment plans. What general aspects of the annual assessment processes are units mastering? Are there any units that you would recommend serve as exemplary models?

The College of Sciences has 30 programs, including a General Studies program which is an interdisciplinary program housed within the College. Of these 30 programs, 9 are Masters programs. One of these, the MA in Biology, has no students enrolled in it at this time. The College also has a Center for Digital Forensics, a Math and Statistics Center, and the Reeves Center for Mathematics Education – all of which were evaluated for this meta-assessment cycle. (*The numerical values reported in the discussion which follows do not include those for the General Studies degree because it is not a science program. This program had an average score of 2.3.)

The results of meta-assessment showed that the department *composite* scores (the average of all measures for all programs in a department) ranged from 1.7 to 3, with the *average of the average* for all programs being 2.1, which corresponds to "Acceptable". More specifically, four programs had composite scores greater than 2 (one of which had a score of 3), and three programs had composite scores of less than 2. Those departments with composite scores less than 2.0 all showed some departmental program variation, with some programs in the department receiving scores above 2 and some below 2.

A summary of the range of scores for each criterion in the rubric, as well as the composite score based on all scores in all programs is given below:

Measures	Range	Composite/ Overall Avg.	# Dept's 1-1.9	# Dept's 2.0-3.0
Goals	1.8-3.0	2.5	1	6
Objectives	2.0-3.0	2.5	0	7
Indicators	1.7-3.0	2.3	1	6
Criterion LO	1.0-3.0	2.0	2	5
KPI PO	1.0-2.0	2.6	2	4
Findings	1.5-3.0	2.2	1	6
Actions	1.0-3.0	2.0	3	4
Prev. Plan	1.3-3.0	2.1	2	5
Curr. Plan	1.5-3.0	2.0	3	4

These results suggest that, *overall*, the departments in the College of Sciences have implemented acceptable assessment plans, though there is room for improvement. All departments scored 2.0 or higher on their objectives, and six of the seven departments scored above a 2.0 on their goals, indicators, and findings. Given this, the College appears to be strong in these aspects of the assessment process.

The College of Science's plan received scores of 2.0 to 3 on all measures. *The College's Plan was evaluated by Dr. Hargrave.

Section 4: Observed Weaknesses within College Assessment Plans
Detail the general weaknesses identified by the College after reviewing its units' assessment plans. What general aspects of the annual assessment process are units struggling with?

In general, the departments were weakest in the areas of Actions and Current Plans, as three of the seven departments scored less than 2.0 on these measures. These results appear to be the result of these departments not directly using the findings to modify the curriculum/coursework. However, it must be acknowledged that, in some cases, the departments were waiting on additional data to make a more informed decision. In one case, no students were enrolled in the program and the department was considering discontinuing it. So, this result does not necessarily reflect a lack of willingness to make use of the results; but, rather, the need for a larger sample size to obtain valid data upon which to act. In other cases, the department focused more on revising the assessment instrument and/or the methods of administering it, rather than developing specific plans to address identified weaknesses.

In a few instances, there appeared to some confusion as to the distinction between indicators and criteria. And, although the stated goals for most departments are, overall satisfactory, it may be appropriate for some departments to add additional goals, as most departments have only two. In addition, new and/or refined objectives and indicators could be identified by some departments/programs and used to improve their formative assessment procedures. This suggestions stems from the observation that, in some programs, the objectives were of such a nature that they did not directly pertain to skills and knowledge needed by students in the program. For example, writing is obviously an important skill, and was listed as an objective by

various programs; however, this skill is not a discipline-specific skill. In such cases, additional objectives of a discipline-specific nature should be added.

Lastly, some of the objectives may have been too broad in that they actually encompassed multiple objectives. For example, if an objective includes assessments of several different skills, and the result is reported as a single composite number, it is not possible to know in which areas students may need further assistance to master the material. Therefore, it would be best to disaggregate composite objectives into separate objectives, each of which could be assessed and acted upon.

Section 5: Strategies Needed to Address Identified Weaknesses
Detail the College's strategies for addressing the general weaknesses identified after reviewing its units' assessment plans.

Some of the departments and programs which received high scores were able to make use of external indicators, such as standardized tests. So, when possible, departments may wish to pursue this option. In addition, those that did well had clearly defined and structured procedures for evaluating student performance, as well as rubrics for several measures. Other departments may wish to pursue these options as well.

As regards specifics, some suggestions for improvement have been identified in the previous section; namely, disaggregating objectives, clarifying the assessment process by providing more information about the procedures and the constraints, making use of data when developing future plans for assessment, and adding more objectives if this will clarify and improve not only the OATDB entries, but the assessment process itself.

In order to improve the quality of the assessment plans and the meta-assessment process itself, a new meta-assessment procedure will be implemented in the next cycle. Specifically, each department will be asked to participate in the meta-assessment process by having one or two members from each department participate in the meta-assessment training and evaluation process. Ideally, one of these members would be the Department Chair or Program Coordinator. Accordingly, each program would be evaluated by at least two people (preferably 3 to break ties in scoring), thereby increasing the reliability and validity of the evaluation process. Once the programs have been evaluated, the evaluators will meet with the Department Chairs to review the results. This should enhance understanding of the findings and provide an opportunity to engage in constructive discussion regarding ways to improve the assessment plans.

One of the greatest potential benefits of this approach is that, by having members of each department involved in the evaluation process, these faculty members will learn more about the assessment process itself and what is expected for SACS re-accreditation. This will occur as a result of the training in the use of the OATDB system and, more importantly, training in the use of the rubrics (which enhances understanding of the assessment process). And, by examining the assessment plans of other departments, evaluators will develop a greater awareness of alternative approaches to assessment, many of which may be beneficial to their own programs. The members of the team can then take this knowledge back to their department and share it with other faculty members. Given that two of the biggest obstacles to improving assessment are a

lack of understanding of how to do assessment and how to use the data to enhance a program, this procedure should lead to improvements in all of these areas. It will also help to allay the long-standing impression that assessment results "disappear" into the system and serve little or no function. In short, by having more faculty members in departments see how the data is obtained and interpreted, and by seeing how the data can be used to drive improvements, the faculty may be more willing to invest in the process of improving their programs based on data.

The Associate Dean of Curriculum and Instruction (ADCI) will coordinate the assignment of duties. And, as previously indicated, both the ADCI and the departmental members that did the program evaluations in his or her department will meet with the Chairs.

The schedule for conducting the meta-assessment process is as follows:
    A. Assessment data entry period closes in September of each year.
    B. College MA committee evaluates the programs in October and November
    C. Completed rubrics are due to the ADCI at the end of the fall semester
    D. Feedback to Dean and Chairs occurs in January/February
    E. Use feedback for next cycle

Section 6: Training/Resources Needed to Implement the College's Improvement Strategy
Detail the types of training and resources that would assist the College with implementing its improvement strategies.

In addition to the issues reference din the previous section, perhaps the greatest hindrance to improving assessment is the fundamental lack of time that Department Chairs have to invest in the process. With so many responsibilities, it is very difficult for them to devote the necessary time and energy to assessment. Ideally, the Chair could designate one or more members of their departments to assist with this process. Perhaps the evaluator/s that will be selected from each department would be ideal for this given that they will learn how the process works and can therefore assist with assessment suggestions and improvements, as well as entry of the information into the OATDB system. It would be especially beneficial to have a designated Assessment Coordinator, modeled after the position in the College of Education, to assist with data input and analysis. Such an individual would work the departments to develop strategies for data collection and handling, and would be responsible for processing most of the data generated by the assessment instruments. However, it is understood that the dynamics in the College of education are quite different from those in the College of Sciences and so, this may not be feasible, especially given the cost.

Once individuals are selected for the new meta-assessment procedure, we will need assistance from the Office of Academic Planning and Assessment to train them in the use of the rubrics, and to help them understand how the meta-assessment process fits into the bigger picture of driving program improvement for the benefit of our students and for understanding how it relates to both SACS and THECB accreditation requirements.

Appendix A

(All Completed Meta-assessment Rubrics)

Appendix B
Spreadsheet Showing Meta-Assessment Results

Department	Program	Overall	Goals	Objectives	Indicators	Criterion LO	KPIs PO	Findings	Actions	Prev Plan	Current Plan	Total	Average
Agriculture	Ag. BS	1.0	2.0	2.0	2.0	1.0		1.0	1.0	1.0	1.0	11.0	1.4
Agriculture	Ag. BS Bus	2.0	3.0	2.0	2.0	3.0		3.0	2.0	1.0	1.0	17.0	2.1
Agriculture	Ag BS ET	2.0	2.0	3.0	2.0	2.0		2.0	2.0	1.0	1.0	15.0	1.9
Agriculture	Ag BS AS	2.0	2.0	2.0	2.0	2.0		2.0	2.0	1.0	2.0	15.0	1.9
Agriculture	Ag BS CS	2.0	2.0	2.0	2.0	2.0		2.0	2.0	1.0	2.0	15.0	1.9
Agriculture	Ag MS	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	1.0	15.0	1.9
Ind Tech	BS CM	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	16.0	2.0
Ind Tech	BS D&D	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	16.0	2.0
Ind Tech	BS	2.0	3.0	3.0	3.0	2.0		2.0	2.0	2.0	2.0	19.0	2.4
Dept.		3.0	3.0	3.0			3.0	3.0	2.0	3.0	3.0	20.0	2.9
Dept. Total	*72 scores*	*20.0*	*23.0*	*23.0*	*19.0*	*18.0*	*3.0*	*21.0*	*19.0*	*16.0*	*17.0*	*159.0*	*1.9*
Dept. Avg.		*2.0*	*2.3*	*2.3*	*2.1*	*2.0*	*3.0*	*2.1*	*1.9*	*1.6*	*1.7*	*21.0*	*2.1*
Biology	Dept	2.0	2.0	3.0			2.0	3.0	1.0	3.0	2.0	16.0	2.3
Biology	BA/BS	1.0	1.0	3.0	2.0	1.0		1.0	1.0	2.0	1.0	12.0	1.5
Biology	MA No Stu	1.0	2.0	2.0	1.0	1.0			1.0	1.0	2.0	10.0	1.4
Biology	MS	2.0	2.0	2.0	2.0	1.0		2.0	1.0	2.0	1.0	13.0	1.6
Dept. Total	*30 scores*	*6.0*	*7.0*	*10.0*	*5.0*	*3.0*	*2.0*	*6.0*	*4.0*	*8.0*	*6.0*	*51.0*	*1.7*
Dept. Avg		*1.5*	*1.8*	*2.5*	*1.7*	*1.0*	*2.0*	*2.0*	*1.0*	*2.0*	*1.5*	*15.5*	*1.7*
Chemistry	Dept	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	24.0	3.0
Chemistry	BS	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	24.0	3.0
Chemistry	For Chem	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	24.0	3.0
Chemistry	MS	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	24.0	3.0
Dept. Total	*32 scores*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	*96.0*	*3.0*
Dept. Avg		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*24.0*	*3.0*
COSC	Dept	3.0	3.0	3.0	3.0			3.0	3.0	2.0	1.0	18.0	2.3
COSC	CS BS	1.0	2.0	2.0	1.0	1.0		1.0	2.0	2.0	1.0	12.0	1.5
COSC	MS	1.0	2.0	3.0	2.0	2.0		1.0	1.0	1.0	1.0	13.0	1.6
COSC	IA MS	3.0	3.0	3.0	3.0	3.0		2.0	2.0	1.0	3.0	20.0	2.5
COSC	DF MS	1.0	2.0	3.0	2.0	2.0		1.0	1.0	1.0	1.0	13.0	1.6
COSC	Cntr DF	1.0	3.0	3.0	3.0	1.0	1.0	1.0	1.0	1.0	2.0	16.0	1.8
Dept. Total	*48 scores*	*10.0*	*15.0*	*17.0*	*14.0*	*9.0*	*1.0*	*9.0*	*10.0*	*8.0*	*9.0*	*92.0*	*1.9*
Dept. Avg		*1.7*	*2.5*	*2.8*	*2.3*	*1.8*	*1.0*	*1.5*	*1.7*	*1.3*	*1.5*	*16.4*	*1.8*
GeoGel	Dept	2.0	2.0	2.0			2.0	2.0	2.0	3.0	2.0	15.0	2.1
Gel	BS	2.0	3.0	2.0	2.0	2.0			2.0	2.0	2.0	15.0	2.1
Geog	BA	2.0	3.0	2.0	2.0	2.0		2.0	2.0	3.0	2.0	18.0	2.3
Geog	BS	2.0	3.0	2.0	2.0	2.0		2.0	2.0	3.0	2.0	18.0	2.3
Geog	MS GIS	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	16.0	2.0
Dept. Total	*38 scores*	*10.0*	*13.0*	*10.0*	*8.0*	*8.0*	*2.0*	*8.0*	*10.0*	*13.0*	*10.0*	*82.0*	*2.2*
Dept Avg		*2.0*	*2.6*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.6*	*2.0*	*19.2*	*2.1*
Stat	MS	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	24.0	3.0
Math	Reeves Ctr	1.0	2.0	2.0				1.0	1.0	1.0	1.0	8.0	1.3
Math	BA	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	16.0	2.0
Math	BS	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	16.0	2.0
Math	MA	3.0	2.0	3.0	3.0	3.0		2.0	2.0	3.0	3.0	21.0	2.6
Math	MS	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	24.0	3.0
Math	Dept	2.0	3.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	17.0	2.1
Math	Center	1.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	13.0	1.4
Dept. Total	*63 scores*	*17.0*	*19.0*	*19.0*	*17.0*	*15.0*	*3.0*	*16.0*	*16.0*	*17.0*	*17.0*	*139.0*	*2.2*
Dept. Avg		*2.1*	*2.4*	*2.4*	*2.4*	*2.5*	*1.5*	*2.0*	*2.0*	*2.1*	*2.1*	*19.4*	*2.2*
Physics	Dept	2.0	3.0	3.0			2.0	3.0	2.0	2.0	2.0	17.0	2.4
Physics	BS	2.0	3.0	3.0	3.0	2.0		3.0	3.0	3.0	3.0	23.0	2.9
Dept. Total	*15 scores*	*4.0*	*6.0*	*6.0*	*3.0*	*2.0*	*2.0*	*6.0*	*5.0*	*5.0*	*5.0*	*40.0*	*2.7*
Dept. Avg		*2.0*	*3.0*	*3.0*	*3.0*	*2.0*	*2.0*	*3.0*	*2.5*	*2.5*	*2.5*	*23.5*	*2.6*
Comp Tot		*79.0*	*95.0*	*97.0*	*78.0*	*67.0*	*13.0*	*78.0*	*76.0*	*79.0*	*76.0*	*659.0*	*2.2*
Comp Avg		*2.1*	*2.5*	*2.5*	*2.3*	*2.0*	*2.6*	*2.2*	*2.0*	*2.1*	*2.0*	*20.2*	*2.2*
College Plan		*3.0*	*3.0*	*3.0*			*2.0*	*2.0*	*2.0*	*3.0*	*3.0*	*18.0*	*2.6*
												0.0	
Gen Studies		*2.0*	*3.0*	*3.0*	*2.0*	*1.0*		*3.0*	*2.0*	*2.0*	*2.0*	*18.0*	*2.3*

* The number of scores used to determine average does not include the overall scores