A student with an advanced degree in chemistry must have sufficient critical thinking and problem solving der to succeed. Graduate Advisory Committees of the graduate students at the time of proposal presentations, l seminar, thesis seminar, and oral defense of the written thesis will make evaluations of student progress on Outcome 1 and 2. Progress and novel ideas for improvement are discussed within these committees, at facu and occasionally at faculty meetings. The resu787(a2n05(r)-0.3f68(f)-0.334(on L)-8.05(m)4.1910.19108)-26(hu4.19108(y)-

Type of Tool: Tracking Spreadsheet

Frequency of Assessment: Every other year (biannual)

Rationale:

Assessment of the **number of refereed scholarly publications** will be those listed in the Directory of Graduate Research (DGR). **Historical Note:** For the years prior to 2001, our departmental faculty had an average of 17 per year. A 5% increase per edition beginning with Outcome 1. **Beginning in 2013**, the DGR no longer published the peer-reviewed publications of each faculty member, thus, assessment changed to the utilization of SciFinder Scholar as a direct measure assessment tool.

The Directory of Graduate Research historically provided a national means for comparing productivity in research publication to that of the faculty in TTU Chemistry. Although this data is no longer available, extraction of publications of each faculty member can be accomplished utilizing **SciFinder Scholar**.

Assessment: Graduate Advisory Committees

Goal/ Outcome/ Objective: Outcome 1 and 2

Type of Tool: Focus Group

Frequency of Assessment: Annual

Rationale:

Graduate Advisory Committees of the graduate students assess student progress at the time of the proposal presentation, the thesis seminar, and the oral defense of the written thesis. This is currently an indirect measure of assessment. See below (and attached) for information concerning a new direct measure of assessment.

A student with an advanced degree in chemistry must have sufficient critical thinking and problem solving skills in order to succeed. **Graduate Advisory Committees** of the graduate students at the time of proposal presentations, literature seminar, thesis seminar, and oral defense of the written thesis will make evaluations of student progress. Progress and novel ideas for improvement are discussed within these committees, at faculty retreats and occasionally at faculty meetings. The results of the Chemistry M.S. Survey of Graduates and the Chemistry M.S. Survey of Faculty are also discussed at faculty meetings and retreats since they contain valuable information as a direct measure of assessment.

External program reviews (every 5 years) also contributes to improvements in the assessment tools utilized by the department. The results of these reviews are maintained in the Chemistry Chair’s office.

Attached Files

Graduate Advisory Committee Thesis Assessment

Assessment: Seminar Program Evaluations Forms

Goal/ Outcome/ Objective: Outcome 1 & 2

Type of Tool: Focus Group

Frequency of Assessment: Annual

Rationale:

Both faculty and students attending student seminars fill out an evaluation form (Attached) on the student speaker. This is helpful to both the student giving the seminar as well as the student grading the seminar. These are kept by the Seminar Program Coordinator, who also provides feedback to students, and to the M.S. Program Coordinator.

Attached Files

Seminar Evaluation Form

Results: Delaware Study, Institutional Research Data and Annual Report

Goal/Objective/Outcome Number: Program Goals 2, 3 & 4

Results:

The following table tabulates acquired funding by the department of Chemistry faculty since 2005. To provide an historical perspective: the four-year total research funding level in the department 1998-2002 was an average of $121K per year. Our target is a research funding level that increases by 5% per year over the previous average. We have **dramatically exceeded this goal (nearly tripled)** as seen in the table below (Ref. Delaware Reports 2005-2006 through 2009-2010 and the Chemistry Annual Report).

External Funding Awarded to Departmental Faculty

Academic Year	Total New Awards	Target Level
2006-2007	$1,037,689	$126K
2007-2008	$36,300	$132K
2008-2009	$283,013	$139K
2009-2010	$103,000	$146K
2010-2011	$122,253	$153K
2011-2012	$236,957	$161K
2012-2013	$94,309	$169K
2013-2014	$568,600	$177K
2014-2015	$725,046	$185K
2015-2016	$1,437,827	$194K
2016-2017	$545,294	$203K
Total last 12 years	**$ 5,310,280**	**$1,905,000**

The average load of the research active faculty is now 9 contact hours, however, the average load when all permanent faculty are considered is 10.5.

We have been removed from the low producing program list and now graduate on average 5-6 MS students/year. This will continuously be monitored on a yearly cycle.

Year	Number of Graduates
2007-2008	4
2008-2009	6
2009-2010	6
2010-2011	6
2011-2012	5
2012-2013	6
2013-2014	4
2014-2015	6
2015-2016	7
2016-2017	10

In order to make progress on Learning Outcome 2, assessment results relevant to communication skills have driven the department to change the way the seminar program is structured. First of all, the coordinator of the Chemistry M.S. seminar program, in consultation with other graduate faculty in the department, have assisted a department faculty member in preparing oral presentation guidelines for students giving seminars in the M.S. program. Secondly, the graduate student's first seminar, the Literature Seminar, has been moved to its own time slot separate from the outside speaker seminar day and time in order to provide a more informal setting with more give-and-take for students' gaining experience in giving presentations. These two changes have improved the performance of M.S. students in our seminar program, as perceived in our Literature and Thesis Seminars results. These are kept on file by the seminar coordinator. Student perception (2015) as evidenced by exit surveys, do not reflect this, even though we have noticed an improvement.

In order to provide Graduate Advisory Committees a direct measure of assessment, the department has created a rubric that can be used to assess graduating students called the Thesis/Research Defense Assessment (Graduate Advisory Committee Thesis Assessment). This is a new assessment tool implemented in 2014, and is thus immature at this time (only 6 students have been scored so far). When utilized, this tool will allow scoring in 7 areas related to Outcomes 1 and 2 (1 to 4 points awarded in each area) and thus allow direct assessment for each Learning Outcome. Beginning in 2015-2016 (third year of use) the data will be more mature and provide trends in each of the areas of assessment.

Link to Assessment:

Graduate Advisory Committee Thesis Assessment with Rubric

Link to Flight Plan: New Graduate Programs

Create Distinctive Programs and Invigorate Faculty

Modifications and Continuing Improvement: Program Goal 1

Goal/Objective/Outcome Number: Program Goal 1

Program Changes and Actions due to Results:

In order to continue to make progress towards Program Goal 1, **we will continue** to use the Clayton Faculty Enrichment Fund in our department, instituted in 2003, **to stimulate faculty development by travel to scientific meetings** to foster greater opportunities in research **that culminate in refereed publications**. A differential teaching load was designed and implemented in 2006 which provided larger blocks of time available for research and scholarly writing. This differential

Annual Report

Link to Flight Plan: Create Distinctive Programs and Invigorate Faculty

Modifications and Continuing Improvement: Program Goal 3

Goal/Objective/Outcome Number: Program Goal 3

Program Changes and Actions due to Results:

In order to continue to make **even greater progress in Program Goal 3** a faculty committee began working on establishing new departmental policies regarding teaching assignments. These reflect time spent in a more quantitative fashion on grant writing, support of student research, special service work, and so forth. The end result was a **differential teaching load based on level of activity** allowing greater time to oversee graduate students, author proposals and maintain funding. The department recently obtained three new permanent positions and four temporary full-time Instructors which have also aided our ability to maintain the current loads in spite of a large increase in the number of students taking chemistry classes since 2007. In the past two years (2014-2016), three of the temporary