

Institutional Effectiveness Report

Assessment Summary

Department or Division: Chemistry

Degree Program: Bachelor of Science

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Assessment Cycle (academic or calendar year): Academic Year

Mission (related to VSU mission): The chemistry major at Valdosta State University is designed to prepare graduates to enter professional school, to attend graduate school or to join the work force in a government, industrial or commercial setting.

Assessment History (discuss here how and when the program developed its current assessment program, what it used prior to starting that program to assess its effectiveness, etc.):

The assessment program in the department of chemistry originated in the 1990's and was developed in response to a program instituted by the vice-president of academic affairs. In this program the following assessment tools were developed:

- Student content knowledge and ability to communicate that knowledge would be tested by an oral presentation on a chemistry subject of the student's choosing.
- The student's ability to properly keep a laboratory notebook and record data would be determined by maintaining a file of copies of student writing samples from laboratory books for classes.
- The student's ability to summarize and explain data would be demonstrated by ungraded samples of reports and papers written for classes.

Originally, it was planned that a departmental committee would meet and evaluate the written examples and the department as a whole would attend and evaluate student presentations. Unfortunately, the assessment plan never moved beyond the data collection phase and the assessment plan required faculty to save and place student assignment in their advising folder. Compliance was a problem, so complete sets of written assignments for any one student were rare. Also, changing priorities on campus made complete implementation of the program a low priority (criteria and evaluation of the materials was never implemented).

The one part of the program which had been adopted and maintained was the student oral presentation, but by 2004, it was clear that it was not an effective evaluation tool for the following reasons:

- since there was no grade, students didn't feel the need to excel at the presentation.
- there were no uniform evaluation criteria for the presentation.
- there were considerable differences between faculty as to what was an acceptable presentation.

To address these deficiencies, an inactive course (CHEM 4210) was reinstated to administer the student seminar. This settled the existing problems because it is a graded course with an agreed upon syllabus.

The success of this change demonstrated the deficiencies in the other evaluation methods. In the fall of 2007, the department formed the Assessment Committee to plan and implement a new assessment model. After reviewing accepted practices in other chemistry departments, the committee recommended and the department approved the following assessment program:

Testing

In-process Assessment (General, Analytical, Organic, Physical Chemistry) using norm-standardized tests developed by the American Chemical Society.

Capstone Assessment

An electronic field test written by ETS, Educational Testing Service, and administered by VSU testing center) will be taken by students to evaluate chemistry knowledge across all chemical disciplines.

Survey

Senior Exit Survey (A survey developed in the chemistry department to measure student satisfaction with the degree program, material covered and research opportunities in our program)

Student Presentation

An oral presentation on chemistry presented for a grade in CHEM 4210.

Expected Student Learning Outcomes:

1. Understand, speak and write in the language used by professional chemists;
2. Demonstrate proficiency in problem solving and experimental design and show proficiency in laboratory procedure and the skills of measurement, analysis, data treatment and interpretation;
3. Demonstrate an understanding of professional ethics in terms of data collection, evaluation and reporting and an understanding of environmental issues concerning handling and disposal of chemicals and chemical wastes; and understand the importance of chemistry in its impact on society;
4. Demonstrate proficiency in the principles and theories that govern chemistry and appreciate the fact that chemistry is a changing discipline which requires a commitment to life-long learning.

Assessments (include when and to whom these are administered, and align goals with specific assessments):

The department is currently in the implementation phase of a new assessment program. The Fall of 2008 marks the first year all facets of the new program will be implemented. The current assessment model uses the tools:

- **In-process Assessment** - American Chemical Society standardized subject area tests for General, Organic, Analytical and Physical Chemistry. Given by faculty at the end of the course. Expected outcomes: 2, 3, 4
- **Capstone Assessment** - An electronic field test by ETS (Educational Testing Service). Given by faculty during the required course CHEM 4210. Expected outcomes: 2, 3, 4

- **Senior Exit Survey** – A survey to determine student attitudes regarding their chemistry education. Given by faculty during the required course CHEM 4210. Expected outcomes: 2, 3, 4
- **Senior Seminar** – The student will present on oral presentation and abstract regarding some aspect of chemistry. The presentation is evaluated by chemistry faculty during the required course CHEM 4210. Expected outcomes: 1, 3, 4.

2005-2006

- **Assessment Results (submit an electronic file of the data collected):**
 - No measureable results to report.
- **Discussion/Dissemination of Results:**
 - No response.
- **Modifications Made:**
 - Committee formed to review and modify senior seminar system. A senior seminar course was activated (CHEM 4210).

2006-2007

- **Assessment Results (submit an electronic file of the data collected):**
 - CHEM 4210 begun and all students participating delivered acceptable talks (by informal faculty evaluation). Unfortunately, the assessment instruments were not of a quality to demonstrate this.
- **Discussion/Dissemination of Results:**
 - No response.
- **Modifications Made:**
 - Faculty teaching CHEM 4210 began developing a new evaluation form for student presentations.

2007-2008

- **Assessment Results (see electronic submitted data):**

In-process Assessment: In each of the courses evaluated, the faculty decided to set proficiency at 50% (i.e. a student should answer 50% of the questions correctly). In most, but not all, cases our freshman classes have approximately 50% of the students meeting this criteria on any given learner outcome. The upper division classes are performing at about the same level. As this was the first year during which all the tests were implemented and it is well known in the chemistry community that the American Chemical Society tests are difficult, it is not clear if there is a problem with our instruction or the definition of proficiency we are using.

Capstone Assessment: Implemented in the spring of 2008. Of the fourteen students taking the examination, six scored at the 57th percentile or higher. There seemed to be a correlation between mathematical skills and test score. Students scored highest in organic and inorganic chemistry

(minimal mathematical skill required) and lowest in physical chemistry (high level mathematical skills required, calculus).

Senior Exit Survey: All students indicated that they were satisfied with their education, though few students selected VSU based on the chemistry department's reputation.

Senior Seminar: The new grading rubric has yet to be instituted in CHEM 4210, so no data are available.

- **Discussion/Dissemination of Results:**
Results of the lower-division ACS tests, capstone assessment and senior exit survey were shared with the entire faculty, while upper division tests were distributed to the faculty responsible for the courses and the department chairman.
- **Modifications Made:**
The assessment committee continues to work on developing an assessment tool for the senior seminar. The current tool asks each evaluator a few broad questions, but does not identify and critically measure important features in preparing and making a technical presentation.

James T. Baxter 1/9/09
Dept. Head/ Director Date

Dean Date

VPAA Date

Adapted from: University of Alabama SACS site (<http://sacs.ua.edu/degreeInfo2.cfm?college=2&dept=50>);

University of Western Kentucky SACS Accreditation Review Process (<http://www.wku.edu/sacs/assessmentmanual.htm>); and

Mrs. Marila D. Palmer, VP-Executive Affairs & Planning, LeTourneau University, Presentation to 2008 SACS-COC Institute