

UNIT ASSESSMENT PLAN 2006-2009

Name of unit: Chemistry

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I. Statement of unit mission:

ⁱThe chemistry program provides preparation for professional work or graduate work in chemistry or forensic chemistry or pre-professional training in the health sciences or secondary education. Through the study of general, organic, analytical and physical chemistry, students gain an understanding of the world around them.

II. Unit intended objectives/outcomesⁱⁱ:

1. Academic Affairs Goal 2: Students develop skills for communication within both the scientific and non-scientific communities
2. Academic Affairs Goal 3: Students become proficient in each of the core areas of chemistry -- general, analytical, organic and physical chemistry
3. Academic Affairs Goal 4: Students demonstrate the ability to integrate the principles of the different core chemical areas into one body of usable knowledge
3. Academic Affairs Goal 4: Students develop critical thinking and problem solving skills
4. Academic Affairs Goal 5:
- 5.
- 6.
- 7.

Of the objectives above, this unit will assess 2 in the current assessment year; and 2 in the next one.

III. Tactics for achieving the objectives:

1. The requirement of completion of CH 407 Seminar in which students research a current chemical or forensic topic and present a seminar on that topic
2. Close student and faculty interaction through limited enrollment upper division classes and research opportunities
3. Providing course opportunities that integrate topics from different chemical disciplines
4. Critical thinking and problem solving exercises skills will be developed through coursework and hands-on laboratory courses, as well as research and practicum opportunities. Students are required to take a capstone two term laboratory course in which students develop methods to solve practical laboratory problems. Students conduct library research and develop laboratory procedures.
- 4.
- 5.
- 6.
- 7.

IV. Basic approach for assessing our unit intended objectives/outcomesⁱⁱⁱ

A. BENCHMARKS FOR SUCCESS^{iv}:

1. : The 40-50 minute long presentation is delivered to an audience. A panel of judges assess the seminar in terms of its scientific quality as well as the quality of the student's communication skills.
2. ACS discipline specific exams will be administered at the end of core courses
2. . The chemistry program will administer national exams to assess the student proficiency a standardized assessment test available from ETS
3. Product samples will be assessed include written research proposals and written and/or oral presentations of project results.

B. RELEVANT QUANTITATIVE AND/OR QUALITATIVE EVIDENCE^v:

1. Evidence for Objective 1: Examination of written abstract and bibliography; seminar slides, the oral presentation and oral questioning for the seminar presentation.
2. Evidence for Objective 2: The comparison of WOU student scores versus national norms on ACS standardized exams at intervals during the student's academic program
3. Evidence for Objective 3: Comparison of student performance on the national ETS chemistry exam. The goal is an 50 percentile average across the student population.
4. Evidence for Objective 3: Evidence of critical thinking and problem-solving skills will be obtained through out the student's academic career through examinations, the solution of laboratory unknown problems and designing and conducting of research projects.

C. MISCELLANEOUS DATA COLLECTION ISSUES^{vi}: *Any special issues regarding data collection and instrument design, as well as pertinent timelines, procedures and stakeholders:*

D. ANALYSIS & INTERPRETATION OF EVIDENCE

E. RESULTS AND REPORTS ^{vii}

F. FOLLOW-UP AND CONTINUOUS IMPROVEMENT: THE FEEDBACK LOOP^{viii}

ⁱ This unit or program mission statement is aligned with and supportive of the University mission as well as the Institutional Aspirations for Learning.

ⁱⁱ The following statements describe qualitative and quantitative measurable expectations of what students should be able to know or do when they've completed this program, including student mastery of competencies, skills or tasks. Some or all of these outcomes are also listed in the 2006 WOU catalog. [Whereas a learning outcome is a statement that identifies the skills, knowledge and/or attitude that a learner will be able to demonstrate as a result of successfully completing an identified part of a learning program, a process outcome is the measurable output of the process in place that leads to the learning and unit effectiveness (including such things as service, functionality, work quality, efficiency, satisfaction and compliance [or other key areas related to context, input, process and product].)

ⁱⁱⁱ The following systematic, comprehensive and continuous approach has been designed for the program/unit and is intended to provide an accurate picture of how effective the program or unit's actual performance is, including whether student performance matches those expectations and standards identified in the objectives (part II above). [The central question here is whether and to what extent the program is achieving its [goals](#) and [objectives](#)?] [Assessment of student learning occurs at the program level - e.g. B.A. or B.S., not just at the course level. This means that goals and outcomes have to be at the program level. Ideally, data on assessment of student learning should be collected at several points in the program (e.g., beginning, middle and completion). Unit annual reports shall include a segment on assessment of student learning. The assessment of student learning through multiple and diverse techniques informs programs about the achievements in student learning and provides useful evidence in conducting program self-assessment.]

^{iv} The unit has identified 1- 3 benchmarks as clear and measurable indicators of success; that is, measurements, standards or criteria that serve as a point of reference by which the unit or program's performance is measured or will be compared to determine a satisfactory level of achievement. [These benchmarks include acceptable or desirable performance targets or levels of proficiencies with regard to the objectives, expectations or outcomes. In effect, for each objective, expectation or outcome, there are criteria, standards or performance descriptors that indicate how well students will meet expectations of what they should be able to think, know or do. These criteria or standards may be described in varying gradients of success as in rubrics or in grades and may be stated in terms of percentages, percentiles or other quantitative measures (Nichols, 2000). External benchmarking enables comparison of inputs, processes or outputs between institutions (or parts of institutions) while internal benchmarking facilitates comparisons within a single institution over time.]

^v Relevant Evidence: The evidence is gathered from multiple sources and is intended to validate/support our understanding of achievements, student learning outcomes, successes and/or failures. [With regard to student learning objectives, methods being used to assess student work and the attainment of outcomes will generally include a rigorous and systematic examination of the following: student portfolios, theses, projects, products, performance tasks and other written work, work samples, paper-based tests, surveys, commercial standardized assessments, student interviews, group projects, observation, concept mapping, observation and dialogue.]

^{vi} Miscellaneous Data issues: [With regard to evidence and high quality data collection, it may be appropriate to address any unique or unusual aspects of measurement/instrument design as well as the procedures and techniques developed to collect evidence and the timeline for tool development or instrument design] [In implementing the assessment plan, units may rely on quantitative and qualitative methods of assessment; external reviewers;

internal reviewers; as well as direct and indirect methods. The key is to identify or develop a quality measure that accurately measures the desired objective. Moreover, it will be helpful to identify any limitations in the measurement technique or instrument design.

For assessment efforts to be reliable and useful for decision making, data should be of the highest quality and tools should be carefully evaluated by the appropriate unit. It will be helpful to pose the following questions:

- Is the measure important? Does it give us meaningful data or is it merely interesting?
- Is the measure and data collected using the measure easily understood? What is being measured and how are data being interpreted?
- Are fluctuations in the measure a result of the department's action and not of someone or something else?
- Does the measure signify achievement of a goal and not just a success of an activity?
- Does this measure provide information which can be used for improvement?]

^{vii} Examples include:

1. Annual Report Assessment Update: Each program's annual report should have a section dedicated to where they are in their assessment plan, updating the Dean/Provost on all aspects and developments in the Assessment Plan as outlined above. Reports should include a list of assessment tools developed, assessments in progress or completed, results or findings elicited from data collection efforts, studies looking into the reliability and validity of the measures, recommendations based on data, any changes/modifications/decisions made based on findings, and requests for additional resources to implement recommendations.

2. Final 3-Year Cycle Summative Report and Recommendations: At the end of the assessment plan cycle, units will submit a final report that addresses the areas specified herein. In addition the final report shall address the results of the assessment process as well as any recommendations and reflections for the future.

The Results portion of the final report shall clearly indicate the findings with regard to each stated objective or outcome, clearly indicating therein the degree of success for each outcome (i.e. the extent to which the specific criteria for success were met). The Report shall also include a recommendation section that addresses any areas of potential improvement and concern. The Report shall also indicate how results were used to improve programs with specific illustrations or examples.

The recommendations shall address the specific decisions based on each outcome's results and identify areas requiring change or improvement in next assessment cycle.

Reflections: This will also be an opportunity to indicate ways to improve the assessment plan process, reflections on the assessment experience as well as next steps toward developing a revised plan as well as any timelines for reevaluation of each outcome (if the outcome is retained) and when each outcome will be assessed again.

^{viii} Units shall follow up on Assessment plan recommendations and any identified areas of concern. Follow up action plans should be developed regarding how assessment results will be used to improve the program, department, and/or services. To the extent possible, assessment results shall be communicated to appropriate audiences and relevant stakeholders for feedback and dialogue. The information gathered should be used to inform how further improvements can be made to programs and services. Likewise, the results that highlight key successes and accomplishments should be touted and broadly disseminated to showcase how well we are serving our students.