2016-2017 Assessment Cycle COS_Chemistry BS

Mission (due 1/20/17)

University Mission

The University of Louisiana at Lafayette offers an exceptional education informed by diverse worldviews grounded in tradition, heritage, and culture. We develop leaders and innovators who advance knowledge, cultivate aesthetic sensibility, and improve the human condition.

University Values

We strive to create a community of leaders and innovators in an environment that fosters a desire to advance and disseminate knowledge. We support the mission of the university by actualizing our core values of equity, integrity, intellectual curiosity, creativity, tradition, transparency, respect, collaboration, pluralism, and sustainability.

University Vision

We strive to be included in the top 25% of our peer institutions by 2020, improving our national and international status and recognition.

College / Department / Program Mission

College Mission
Provide the college mission in the space provided. If none is available, write "None Available in 2016-2017."
Our mission is to serve our students, the citizens of Louisiana, the nation, and the world, through innovative and stimulating educational experiences and compelling research initiatives that create knowledge, deepen our basic understanding of the world around us, further economic development, and enhance quality of life. In support of our mission, The College of Sciences seeks to:

Develop broad-thinking students into mature, ethical professionals, scientists, and researchers with the necessary creativity, critical thinking, and problem solving skills required to make significant contributions to industry, government, and the academic sector.
Recruit and support top-notch teaching and research faculty engaged in scientific endeavors that are recognized nationally for their relevance and impact.
Enrich scientific research and education through on-campus collaborations, multidisciplinary programs, large-scale multi-institution initiatives, as well as partnerships with government and industry.
Foster scientific literacy within the University, the citizens of Louisiana, and the nation by providing stimulating courses for our students and by partnering with educators at the K-12 and community college level.
Provide leadership in the translation and application of research into practical solutions that will benefit our local community, the state of Louisiana, our natural environment, industries of the Gulf Coast region, and society as a whole.

The Ray P. Authement College of Sciences will emerge as a preeminent college of sciences in the Southeast and Gulf Coast region of the United States. The College will be recognized nationally for its innovative education, scholarly research activities addressing our nation's grand challenges, and for its diverse student body with exemplary academic achievements, leadership abilities, and global perspectives.

Department / Program Mission
Provide the department / program mission in the space provided. If none is available, write "None Available in 2016-2017".

The mission of the UL Dept. of Chemistry is to provide instruction of chemistry subjects to students majoring in either Chemistry itself, or in other scientific fields such as physics, biology, etc. The purpose of this instruction is to provide students with both the fundamentals upon which the field of chemistry is based, and to equip students with the latest techniques, knowledge base and breadth of application of chemistry to both the sciences and society. The Department of Chemistry at UL Lafayette is certified by the American Chemical Society and is committed to advancing the intellectual, technological, cultural and scientific knowledge of its students and faculty following the highest standards of scientific inquiry. The mission of the department is accomplished through the use of several mechanisms including 1) classic and innovative classroom and laboratory instruction, 2) student advising and 3) undergraduate research. The department strives to teach students to be independent scientists and scientifically literate citizens. By partnering with communities both inside and outside the University, the department supports the application of the chemical sciences to address the societal needs for both chemistry and science majors, but also for non-science majors as well.
The Dept. of Chemistry also services in the capacity of a service department offering a range of chemistry courses designed for specific non-chemistry majors to provide needed and useful chemical knowledge to such students.

Assessment Plan (due 1/20/17)

Assessment List (Goals / Objectives, Assessment Measures and Criteria for Success)

Assessment List

<table>
<tr><td>Goal/Objective</td><td>Free up/modify lab space to accommodate newly hired faculty</td></tr>
<tr><td>Legends</td><td>PO - Program Objective (academic units);</td></tr>
<tr><td>Standards/Outcomes</td><td>
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<tr><th>Identifier</th><th>Description</th></tr>
<tr><td>Research SI.Research SI 1</td><td>Enhance supporting infrastructure for the conduct of research and innovation.</td></tr>
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<tr><td>Assessment Measures</td><td>
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<tr><th>Assessment Measure</th><th>Criterion</th><th>Attachments</th></tr>
<tr><td>Direct - Facility update (Other)</td><td>Upgrade one lab for materials scientist by installing new access door and water supply, renovating a second lab for polymer chemist</td><td></td></tr>
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Goal/Objective	Students will know the basic laws, principles and concepts of chemistry and be able to recognize examples of chemical processes or reactions as falling under one or more laws and principles of chemistry and cite the law or principle applicable. They will be able to define and explain the various laws and principles of chemistry as well as analyze, calculate and solve problems. Students will be able to classify various chemical reactions and calculate mass relationships among the reactants used and products formed in solving chemical reactions equations and discriminate between limiting and nonlimiting reactants. Students will be able to recognize, identify and classify the nature of chemical processes taking place around them in everyday life and can differentiate and discriminate between chemical versus physical processes. This includes distinguishing between corresponding exothermic or

<table>
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They will know the organization of the Periodic Table of the Elements, including the classification of the elements therein and be able to estimate relative electronegativities and atom relative size trends. They will be able to explain and formulate the electronic structure of the classes of elements, and assess reactivity trends.

Students will understand and know the structure and properties of atoms, ionic and covalent compounds. They will know and recognize the gas laws, be able to calculate and solve gas law problems, and distinguish between the four states of matter. They will know and recognize the colligative properties of aqueous solutions, and be able to work, calculate and solve such problems presented to them.

The students will know and be able to distinguish between various forms of energy, categorize, differentiate and explain energy relationships of chemical reactions, physical processes and predict exothermicity or endothermicity. Students will know and distinguish between rates or reactions and equilibria of reactions.

Students will know acid-base relationships, distinguish between strong and weak acids and bases, identify pH category of acids and bases and their salts. They will know and be able to calculate pH from concentrations of strong and weak acid or base solutions. Students will be able to explain and distinguish between polar and nonpolar substances, solutions and interactions. Students will know the meaning of oxidation and reduction, recognize REDOX processes, and distinguish between oxidizers and reducers.

Students will understand, know, and recognize valence bond theory principles, hybridizations and the concepts of molecular and electronic shapes of molecules. They will be able to determine from the chemical formulas of molecules, their hybridizations and shapes.</td></tr>
<tr><td>Legends</td><td>SLO - Student Learning Outcome/Objective (academic units);</td></tr>
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Results & Improvements (due 9/15/17)

Results and Improvement Narratives

Assessment List Findings for the Assessment Measure level for Free up/modify lab space to accommodate newly hired faculty

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Assessment Measures

Assessment Measure	Criterion
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Assessment Findings

Assessment Measure	Criterion	Summary	Attachments of the Assessments	Improvement Narratives
Direct - Standardized Test	Has the criterion Chem 107 Chemistry Majors will score the same percentage correct answers on a Standardized National Exam in General Chemistry as those taking that standardized exam. been met yet? Met	According to results of a national standard exam in general chemistry, 70% of all students taking the exam answered 50% of the questions correct. The UL Dept. of Chemistry General Chemistry courses for Chemistry Majors are Chem 107 and Chem 108. As the Table 107/108 for Fall 2016 Semester shows, the six chemistry majors enrolled in Chem 107	Yrs_16_17_107_108_Q_A_Table.pdf	- Assessment Process: Continuous monitoring: The results for this first assessment of Chem 107 on the surface are encouraging. 86% of our students did achieve a score of ≥50% correct answers on the selected (modified) Standardized National Exam questions in General Chemistry (I). However, the number of Chem Majors is rather small and thus we cannot place a great deal of

			each correctly answered at least 50% of the questions derived from the national standard exam in general chemistry put to them. This score compares well with the national average score published by the American Chemical Society. Historically, our initial benchmark was for 70% of chemistry majors correctly answering 70% of the selected questions derived from a national standard exam in a chemistry discipline. Though this level of performance seemed minimally reasonable, it proved very difficult to realize in many cases. After an examination of national standard exam		significance in this result as this is the first time the course has been assessed. Additionally, the sampling is not of one course (section) but across several sections, each with a varying number of Chem Majors. The Table 107/108 represents a composite compilation of all those sections. As a result, each section chose different questions from the others, as well as a different number of questions. What the Department SACS Committee is in the process of doing is to arrange for each such section in the future to chose the same questions and the same number of questions to

			performance analysis, it was found that national student performance fell considerably below the initial level of performance sought of our own students. This point is the focus of a discussion on this matter in the YR 14-15 assessment. Interestingly, the average score for Chem 107 students is 61% correct, 9% points below the desired 70% initially chosen. The six that did answer 50% correct constitutes 86% of the students doing so. The examination of our chemistry majors' performance in Chem 107 is appropriate as it is a required course, and critically important in its reach beyond		be included on the final exams of the various sections so we reduce those two variables to the same for each section. As noted in a previous plan, we wish to not emphasize any one semester or section, but rather to sum the results for each subsequent semester across all such semester sections (as was done herein for this year's assessment), as well as to sum the results across several semesters. In doing so, we hope that other immeasurable variables will be "smoothed out" and a better statistical assessment will be realized from such an approach. To do the above, we will need to emphasize

				Chem 107. What students learn in Chem 107 is the foundation for all chemistry courses. Assessing our chemistry majors' performance in Chem 107 can serve as an aid in assessing performance of students in other chemistry courses and labs where the Chem 107 fundamentals are routinely used. However, only three of the six chem majors scored at or above 70% correct answers so if the 70%/70% initial benchmark is still a future goal, there remains work to be done in this area. But, the issues for which some students did not perform as well as		this approach to the Chem 107 faculty, as well as devise a means of selecting the questions, rendering appropriate modifications to the questions (the Standardized National Exams are copyrighted), so the fundamental focus of the modifications of the selected questions adheres to the focus of the Standardized National Exam questions, and then to insure that the Chem 107 faculty all get the same finalized questions for inclusion on their final exams. There is a bit of a "logistical" problem in doing so as who teaches Chem 107 changes some from semester to semester, and with faculty

			others, particularly the one student achieving only 22% correct, are diverse and far-reaching, and in many instances, not quantifiable. Of course, the one student in question may simply be an academically poor student. Nonetheless, the initial results in this assessment are encouraging, but several such semester analyses are required to see if this holds as somewhat a norm, or if it is an anomaly. Student performance in one group to another can vary widely from one semester to another. In other words, this result herein may not be the likely norm. One semester's		changes due to retirements, other departure reasons, and new hires, this will require several different levels of involvement such as the Department Head (course assignments), Chem 107 Committee, and the Department SACS Committee, and of course, finding times for all concerned to meet for the planning, selection, and disseminatio n of questions (secured). - : The results of Chem 451 are well above initial expectations. However, the results were nearly stellar, and the quality of students in this class for this assessment cycle may or may not be an anomaly. The Dept. SACS

			result does not make a proof.		Committee wishes to continue to monitor Chem 451 over subsequent semesters and years to compare subsequent class results.
		Has the criterion Chem 430(G) is analytical chemistry. Chme Majors are required to achieve a minimum percentage correct answers on selected (modified) questions chosen from a Standardized National Exam in Analytical Chemistry. been met yet? Met	Inorganic Committee Assessment of Chem Major performance The results for Chem Majors taking Chem 451 was 25 percentage points higher than that of all students taking the Standardized National Exam in Inorganic Chemistry. This is deemed a very good outcome for the Spring 2017 course offering. The average performance of the Chem Majors was 68%, only 2% points under the desired 70% sought for our majors. It is the Inorganic Committee's view that we		- Assessment Process: Continuous monitoring: The results for Chem 451 were greater than expected. Given the stellar results, the question arises: is this an anomaly or is it a norm. Based upon this first assessment, the Dept. SACS Committee can made no determination of this question. Consequently, the Dept. SACS Committee wishes to continue monitoring this course over the next few or several semesters offered, and through comparisons, assess the

			should let current material coverage and presentation remain the same for the follow-on course offering to see how subsequent class students do on the selected (modified) questions used from the Standardized National Exam in Inorganic Chemistry. By so doing, we can compare the two different classes. SACS Committee View: The results achieved by Chem Majors in Chem 451, Inorganic Chemistry, is a very good result for first time assessment of this course. We cannot state that these students are better than past students since this is a first time assessment.		performances of the various offerings in light of several semesters.

			Subsequent offerings and results of our Chem Majors' performance will provide a better basis upon which to make any judgements. We recommend that the Inorganic Committee retain the same selected, but modified questions chosen from the Standardized National Exam in Inorganic Chemistry used on their final exams for this course so that variable remains fixed. Their judgement to retain the same lecture course content, coverage and presentation methodology is in keeping with also fixing as many variables as possible.		

Reflection (Due 9/15/17)

Reflection

1) How were assessment results shared in the unit?
Please select all that apply. If "other", please use the text box to elaborate.
Distributed via email
Presented formally at staff / department / committee meetings
Discussed informally (selected)
Other (explain in text box below) (selected)

Results are known to instructors, including the raw data (see Table 430(G), to the department, and to everyone involved in the assessment process. In Department meetings issues related to assessment are discussed as they come up, and questions regarding implementation and outcomes are addressed.

2) How frequently were assessment results shared in the unit?

Frequently (>4 times per cycle)
Periodically (2-4 times per cycle) (selected)
Once per cycle
Results were not shared this cycle

3) With whom were assessment results shared?
Please select all that apply.
Department Head (selected)
Dean / Asst. or Assoc. Dean
Departmental assessment committee (selected)
Other faculty / staff (selected)

4) What were the measurable or perceivable effects on your current (2016-2017) findings based on prior action plans (created in 2015-2016)?

We cannot make comments on such effects as this is the first cycle in which Chem 430(G) was assessed. The results are quite good, and it is the view of all concerned to let the current instructional methods, content, and selected (modified) questions employed from the Standardized National Exam in Analytical Chemistry stand as is through subsequent Chem 430(G) offerings to see how follow-on course meetings pan out in comparison to current cycle course results. Statistically, the Dept. SACS Committee is reluctant to place significant weight to these results owing to the small student sample size, and the excellent result seen.

5) What has the unit learned from the current assessment cycle?

At present, given statistical sample size, results, and other immeasurable variables operating behind class performance, little in conclusion can be claimed for this single event assessment. After several such course assessments made over subsequent semesters, perhaps some trends, etc. may emerge form which some reasonable conclusions can be made.

Attachments

Attachments

Upload any supporting documents related to your assessment plans, results, or improvements. Documents may include rubrics, survey questions, reports, etc. There is no limit to the number of documents you can upload.

Click "Select File" to upload document(s)

Sp17_430G_Table.doc
SACS_General_Action_Plan.doc
ACS_Std_Exam_Averages.doc