

Completed

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Mission

The mission of the SMU Chemistry department is to offer a rigorous and contemporary curriculum which reflects the expertise of the chemistry faculty and to recruit, retain, and graduate qualified students on time. Moreover, PhD chemistry students will have a deep and advanced understanding of the wide array of principles and practices that comprise the field of modern chemistry.

Outcomes/Objectives	Measure	Target	Findings
<p>1 GOAL</p>			
<p>Outcome has action plan</p> <p>1.1</p> <p>Evaluate Information, Analyze an Organic Compound</p> <p>Students will demonstrate the ability to evaluate information by separating, purifying and identifying an organic product.</p> <p>ACTION PLAN DUE no due date set</p>	<p>1.1.1</p> <p>Complete Test Questions in a Take-Home Exam in CHEM 6111</p> <p>Students will be evaluated on completion of a question consisting of several parts that covers the separation, purification and identification of organic compounds. The question will be part of a take-home exam. A copy of the question is attached in the file "Question for Organic Compound 1.1.1."</p>	<p>1.1.1.1 Met</p> <p>Successful Completion of Question on Separation, Purification and Identification of an Organic Compound</p> <p>On a scale of 1 to 5, all students will score a 3 or above.</p>	<p>Students answered a question on a take-home exam on separation, purification, and identification of organic compound. 50% of students scored a 4, and 50% of the students scored a 5. An example of a student's answer is attached in the file "Answer to Organic Compound Question 1.1.1.1." A list of scores are in the attachment "scores for organic compound 1.1.1.1" They are divided by 7, multiplied by 5 and rounded off to fit the 1-5 scale.</p> <p>PLANS FOR IMPROVEMENT</p>

Outcomes/Objectives	Measure	Target	Findings
			<p>(WHAT WILL BE DONE NEXT? HOW WILL THE DATA BE USED? HOW DOES THE FINDINGS DIFFER FROM PRIOR YEARS?)</p> <p>Improved student performance will be achieved by increased attention on how IR spectroscopy can be used to determine product mixtures; see 1(b) in the attachment "Question for Organic Compound 1.1.1."</p>
<p>1.2</p> <p>Representing Physical Phenomena Through Abstract Models, Chemical Mechanisms</p> <p>Students will demonstrate the use of models by analyzing and constructing mechanisms through taking a cumulative exam.</p>	<p>1.2.1</p> <p>Cumulative Exam</p> <p>Students are given the opportunity to take a cumulative exam on chemical mechanisms. A copy of the exam is attached in the file "cumulative Exam for chemical mechanisms 1.2.1."</p>	<p>1.2.1.1 Met</p> <p>Successful Cumulative Exam</p> <p>On a scale of 1-5, 60% of the students should score 3 or above.</p>	<p>Students took the exam on chemical mechanisms. Of 11 students taking the exam 2 students scored a 5, three students scored a 4, 3 students score a 3, one student scored a 2, and two students scored a 1. A copy of a student's answers to the exam questions is in the attached file called "chemical mechanism student 1.2.11." The distribution of scores is in the attachment "scores for chemical mechanism 1.2.1.1." Scores were rounded off.</p> <p>PLANS FOR IMPROVEMENT (WHAT WILL BE DONE NEXT? HOW WILL THE DATA BE USED?)</p>

Outcomes/Objectives	Measure	Target	Findings
			<p>HOW DOES THE FINDINGS DIFFER FROM PRIOR YEARS?)</p> <p>Graduate students obtain a wide breath of knowledge of chemical mechanisms. Chemical Mechanisms is a new objective this year. It was formulated in response to the request for more specific objectives. The closest comparison that can be made to last year is the objective of Breadth of Knowledge. In Breadth of Knowledge the student took 12 cumulative exams each worth 5 points. A student must have obtained 25 points. Last year 5 students completed the exam requirement.</p>
1.3	1.3.1	13.11 Met	Test questions were answered on

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<p>Analyze and Apply Basic Concepts and Principles, Molecular Orbital Theory</p> <p>Students will apply basic concepts and principles of molecular orbital theory.</p>	<p>Complete test questions from chem 6313</p> <p>Test questions will be completed on molecular orbital theory during the term of CHEM 6313. A copy of the test questions is included on pages 2 to 5 in the attached file " histogram of scores, exam questions and answers, chem 6313 1.3.1.1."</p>	<p>Passing the test questions.</p> <p>On a scale of 1-5, 90 % will score 3 or above.</p>	<p>molecular orbital theory. On a scale of 1 to 5, 25% of the students scored 3, 50% of the students scored 4, and 25% of the students scored 5. A sample of a student's answers to the test questions is provided on pages 2 to 5 in the attached file; "histogram of scores, exam questions and answers, chem 6313 1.3.1.1."</p> <p>PLANS FOR IMPROVEMENT (WHAT WILL BE DONE NEXT? HOW WILL THE DATA BE USED? HOW DOES THE FINDINGS DIFFER FROM PRIOR YEARS?)</p> <p>The plan for improvement is to make molecular orbital theory more assessable. While students indicated they learned a lot of new material, they generally found it to be a steep learning curve and hard to digest. In order to smooth this transition, the subject will begin with simpler examples of diatomic molecules like molecular oxygen and nitric oxide before moving to more advanced polyatomic molecules. In this way, it is expected that students will increase their comfort level</p>

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			<p>and familiarity with molecular orbital theory before progressing to more complex molecules. This year is the first time that this objective was considered. Its consideration is in response to the request of more specific outcomes/objectives. The findings are reasonable for a PhD class that is required to have a sound knowledge of a fundamental topic. There are no past results that can be compared to these findings.</p>
<p>1.4 Integrate Data and Evidence, Identify Compounds from Spectroscopic Data Students will integrate data and evidence through identifying specific compounds from spectroscopic data.</p>	<p>1.4.1 Exam Questions The objective will be covered by four questions from the final exam in CHEM 6113. The questions are in the attached file "spectroscopy chem 6113 Questions 1.4.1."</p>	<p>1.4.1.1 Met Pass Exam Questions On a scale of 1 to 5 all students will score 3 or above.</p>	<p>Students answered exam questions on identifying compounds through spectroscopic data. There were 7 students. On a scale of 1-5. 4 students scored 5, one student scored 4 and 2 students scored 3. A copy of a student's answers to the exam questions is in the attached file "6113 spectroscopy copystudentwork 1.4.1.1." A copy of the distribution of scores are in the email sent by the instructor attached in the file "scores for slos for spectroscopy 1.4.1.1."</p> <p>PLANS FOR IMPROVEMENT (WHAT WILL BE DONE NEXT?)</p>

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			<p>HOW WILL THE DATA BE USED? HOW DOES THE FINDINGS DIFFER FROM PRIOR YEARS?)</p> <p>Dedicate more time to "correlations in spectra" which will improve students' performance; for example, see question 6 in the attachment "6113 spectroscopy copystudentwork 1.4.1.1." This is a new objective this year and is in response to the request for more specific objectives.</p>
<p>1.5</p> <p>Individual Research</p> <p>Students will design, execute, record, analyze, and draw suitable conclusions on individual research projects and communicate the significance of their conclusions in writing.</p>	<p>1.5.1</p> <p>Publications</p> <p>Ph. D. Dissertation and Journal publications.</p>	<p>1.5.1.1 Met</p> <p>Complete Dissertation and Other Publications</p> <p>All students must write and defend a dissertation describing results from original research. At least 80% of graduating students will have submitted a publication to a peer-reviewed journal.</p>	<p>Two students graduating in 2017-2018 successfully wrote and defended a dissertation on original research. Each graduate published at least one article in peer-reviewed journals.</p> <p>PLANS FOR IMPROVEMENT (WHAT WILL BE DONE NEXT? HOW WILL THE DATA BE USED? HOW DOES THE FINDINGS DIFFER FROM PRIOR YEARS?)</p>