

COURSE SLO ASSESSMENT REPORT, SCC

Department: ___Chemistry_____ Course: _____Chem 249_____

Year: ___2013_____ Semester: ___Fall_____

1) Outcome to be assessed by dept members	A- Apply major concepts of chemical reactivity of organic compounds to solve problems					
2) Means of assessment and criteria of success	A multiple choice final exam will be given to test the students' basic understanding of concepts covered in Organic Chemistry.					
3) Summary of data collected	One section of Chem. 249 was assessed with 17 students. Forty multiple choice question exam was given with an average of 27.5 correct answers (68.8%). Note: same exact version of the MCQ exam as Spring 2013					
	Question number	Number of wrong answers	% students missed	Question number	Number of wrong answers	% students missed
	1	14	82%	21	8	47%
	2	3	18%	22	8	47%
	3	1	6%	23	2	12%
	4	2	12%	24	6	35%
	5	0	0%	25	5	29%
	6	2	12%	26	8	47%
	7	4	24%	27	2	12%
	8	4	24%	28	6	35%
	9	3	18%	29	5	29%
	10	0	0%	30	6	35%
	11	1	6%	31	3	18%
	12	0	0%	32	2	12%
	13	2	12%	33	3	18%
	14	4	24%	34	7	41%
	15	12	71%	35	11	65%
	16	13	76%	36	5	29%
	17	9	53%	37	10	59%
	18	9	53%	38	4	24%
	19	13	76%	39	3	18%
	20	0	0%	40	11	65%

<p>4) Analysis and discussion of data</p>	<p>The students had trouble with the following concept questions: Question # 1(Constitutional isomers)* Question # 15 (Carbocation rearrangement)* Question # 16 (Stereochemistry of dehydrohalogenation)* Question #17 (Stereochemistry of dehydrohalogenation) Question #18 (regiochemistry of dehydrohalogenation) Question #19 (tosylate resonance)* Question # 35 (E vs S_N2)* Question #37 (alkene to alkyne reagents) Question #40 (base strength)</p> <p>*Questions were among the 7 most missed questions during Spring 2013 as well.</p> <p>We have shown improvement in the area of degrees of unsaturation and cyclohexane chair conformations (Q. 8 & 22) compared to the semester prior. However, 5 of the 9 questions with high percentage of wrong answers (#s 1,15, 16, 19 & 35) are still the same from the semester before.</p> <p>4 out of 17 students (24%) scored below 60% on the MCQ part of the final exam. That means we have 76% of the students achieving SLO A on the course.</p>
<p>5) How your EMP and DPP planning process will utilize what was learned through the analysis of your program's assessment of learning outcomes</p>	<p>SLO A was achieved as 13 students (76%) score at least 60% on the exam.</p> <p>Question #s 1, 15, 16, & 35 have been highly missed since we implemented this assessment in 2011; they are tough concepts, but ones that we spend a large amount of time on in lecture. We will look into the clarity of the wording of those MCQs to see if further revisions are needed.</p>

COURSE SLO ASSESSMENT REPORT, SCC

Department: Chemistry Course: Chem 249
Year: 2013 Semester: Fall

1) Outcome to be assessed by dept members	B- Write in scientific terms and interpret patterns of reactivity on the basis of mechanistic reasoning			
2) Means of assessment and criteria of success	A rubric will be used to show their ability to use mechanistic reasoning to write a complete mechanism for a reaction they are not familiar with. The mechanism was for the hydrobromination of 3,3-dimethyl cyclopentene to form 1-bromo-1,2-dimethylcyclopentane.			
3) Summary of data collected	One section was assessed with 17 students.			
	Beginning (0)	Developing (1)	Competent (2)	Accomplished (3)
Electron flow consistent with nucleophiles, electrophiles, leaving group or rearrangement in each step	2 students (12%)	4 students (24%)	3 students (18%)	8 students (47%)
Charges are always depicted on all intermediates	3 students (18%)	4 students (24%)	1 student (6%)	9 students (53%)
Product of each step in the mechanism is clearly drawn	2 students (12%)	3 students (18%)	2 students (12%)	10 students (59%)

	<p>Overall score on the mechanism/assessment (out of 9 possible):</p> <p>0: 2 students (12%) 1: -- 2: -- 3: 3 students (18%) 4: 1 student (6%) 5: 1 student (6%) -----Competent----- 6: -- 7: 1 student (6%) 8: 2 students (12%) 9: 7 students (41%)</p> <p>Note: “competent” in each section is equivalent to a score of “2”. Competent on all 3 sections would equal an overall score of 6.</p>
<p>4) Analysis and discussion of data</p>	<p>From the above data, it is shown that 10 out of 17 students (59%) are competent or above at writing reaction mechanisms overall; 7 students (41%) were below.</p>
<p>5) How your EMP and DPP planning process will utilize what was learned through the analysis of your program's assessment of learning outcomes</p>	<p>The SLO was not met as only 10 (59%) students were at the level of competent or above when drawing reaction mechanisms.</p> <p>This is a definite decrease in our passing of the SLO compared to the prior semester. These numbers were hurt drastically since 2 students (12%) did not even attempt the problem. If these are not considered in the analysis then 10 students out of only 15 (67%) passed the SLO. Having such statistically low numbers (only 17 data points), it may be best to combine this data over a year and/or only analyze the data when we have 2 or more sections of the class.</p>

COURSE SLO ASSESSMENT REPORT, SCC

Department: ___Chemistry_____ Course: _____Chem 249_____

Year: ___2013_____ Semester: ___Fall_____

1) Outcome to be assessed by dept members	C- Follow published reaction protocols to synthesize, isolate, purify and characterize compounds using standard laboratory equipment and modern instrumentation then interpret laboratory results			
2) Means of assessment and criteria of success	A rubric is used to grade their laboratory report. This particular laboratory report was for synthesis protocol using Grignard reagent. They had to provide a full laboratory report and include IR analysis of their product.			
3) Summary of data collected	One section was assessed with 17 students.			
	Beginning 0	Developing 1	Competent 2	Accomplished 3
Purpose	-----	4 students (24%)	8 students (47%)	5 students (29%)
Reaction and Mechanism	-----	6 students (35%)	3 students (18%)	8 students (47%)
Physical data table with theoretical yield	1 student (6%)	6 students (35%)	7 students (41%)	3 students (18%)
Procedure	1 student (6%)	1 student (6%)	1 student (6%)	14 students (82%)
Observation and data (observation, masses, m.p. and IR/GC)	1 student (6%)	1 student (6%)	6 students (35%)	9 students (53%)
Calculations	3 students (18%)	1 student (6%)	3 students (18%)	10 students (59%)

Analysis (yield, m.p., purity, GC/IR)	-----	9 students (53%)	2 students (12%)	6 students (35%)
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Overall score on the lab report/assessment (out of 21 possible):

0: --

1: --

2: --

3: --

4: --

5: --

6: --

7: **1 student (6%)**

8: --

9: **1 student (6%)**

10: --

11: **1 student (6%)**

12: --

13: **2 students (12%)**

-----Competent-----

14: 1 student (6%)

15: 2 students (12%)

16: 3 students (18%)

17: 1 student (6 %)

18: 3 students (18%)

19: 2 students (12%)

20: --

21: --

Note: "competent" in each section is equivalent to a score of "2". Competent on all 7 sections would equal an overall score of 14.

<p>4) Analysis and discussion of data</p>	<p>From the above data, we can see that 12 out of 17 (71%) of the students are competent or above in writing laboratory reports overall.</p> <p>Overall, the students are doing well at writing lab reports. This comes from the repeated practice while writing at least one lab report per week throughout the semester of Chem 249.</p> <p>This is an improvement in the “reaction & mechanism” and “physical data table” sections compared to the semester prior. This improvement is most likely due to the increased time spent in lab covering how to correctly fill out a data table as well as writing mechanisms for the experiments.</p> <p>The students struggled the most with “Analysis” of their reaction/experiment (only 47% were competent or above). Most students included some analysis, but did not discuss <u>all</u> necessary components (yield, purity, and functional groups present (IR analysis)).</p> <p>When the scores for reaction and mechanism were low (35% of students scored below the competent level), it was due to an overall reaction being written but lacking an arrow pushing mechanism. Likewise, reports with low scores for the physical data table section (41% of the students were below competent) were typically missing the theoretical yield for the product included in the table.</p> <p>It should be noted that this was the last lab report of the semester and due 2 days sooner than the rest of the lab report throughout the semester; fatigue may have played a role.</p>
<p>5) How your EMP and DPP planning process will utilize what was learned through the analysis of your program's assessment of learning outcomes</p>	<p>SLO C was achieved as 12 (71%) students were at the level of competent or above in writing a lab report.</p> <p>In order to improve student achievement in the lacking areas, we will provide a handout detailing what should be included in every lab report. Students should be able to follow this “checklist” to be sure they are not omitting any sections.</p>