Department Earth, Space, and Physical Sciences (Chemistry) Year: ____2012__ Semester:_____S2012___
Santiago Canyon College
Dept Review Sub-report for Sections C – D on SLO Assessment (Chem 249)

*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 their basic concept understanding of the material.
3) Summary of data collected	Two sections of chem. 249 were assessed with 35 students. Forty questions exam was given with a class average of 31.3 correct answers.

Question number	Number of wrong answers	% students missed	Question number	Number of wrong answers	% students missed
1	20	57%	21	4	11%
2	4	11%	22	13	37%
3	2	6%	23	3	9%
4	0	0%	24	13	37%
5	0	0%	25	16	46%
6	0	0%	26	3	9%
7	9	26%	27	4	11%
8	22	63%	28	18	51%
9	3	9%	29	24	69%
10	1	3%	30	5	14%
11	0	0%	31	2	6%
12	2	6%	32	2	6%
13	2	6%	33	1	3%
14	0	0%	34	21	60%
15	15	43%	35	21	60%
16	19	54%	36	5	14%
17	13	37%	37	11	31%
18	4	11%	38	3	9%
19	0	0%	39	5	14%
20	0	0%	40	13	37%

4) Analysis and discussion of data	The students had trouble with the following concept questions: Question # 1(Constitutional isomers) Question # 8 (Chair cyclohexane conformations) Question # 15 (Carbocation rearrangement) Question # 16 (Stereochemistry of dehydrohalogenation) Question # 25 (Regiochemistry of hydroboration oxidation) Question # 28 (Enantiomers and diastereomers) Question # 29 (Addition to cis and trans double bonds) Question # 34 (SN^2 conditions) Question # 35 (Elimination over SN^2) Only 9 out of 35 students (25%) scored below 70% on the final exam. That means we have 75% of the students achieving SLO A on the course.
5) How your EMP and DPP planning process will utilize what was learned through the analysis of your program's assessment of learning outcomes	Using the same final exam as spring 2011, the average correct answers improved from 28.3 to 31.3. Several topics showed a problem in students' understanding. Compared to spring 2011, the students missed exactly the same types of question as spring 2012. Students need more practice with these topics. A new final exam will be used next spring with rewording of some of these questions.

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<table>
<tr><td>*1) Outcome to be assessed by dept members</td><td>B- Write in scientific terms and interpret patterns of reactivity on the basis of mechanistic reasoning</td></tr>
<tr><td>2) Means of assessment and criteria of success</td><td>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.</td></tr>
<tr><td>3) Summary of data collected</td><td>Two sections were assessed with 35 students.
<table>
<tr><th></th><th>Beginning (0)</th><th>Developing (1)</th><th>Competent (2)</th><th>Accomplished (3)</th></tr>
<tr><td>Electron flow consistent with nucleophiles, electrophiles, leaving group or rearrangement in each step</td><td>5 students (14%)</td><td>15 students (43%)</td><td>4 students (11%)</td><td>11 students (32%)</td></tr>
<tr><td>Charges are always depicted on all intermediates</td><td>6 students (17%)</td><td>14 students (40%)</td><td>6 students (17%)</td><td>9 students (26%)</td></tr>
<tr><td>Product of each step in the mechanism is clearly drawn</td><td>6 students (17%)</td><td>14 students (40%)</td><td>4 students (11%)</td><td>11 students (32%)</td></tr>
</table></td></tr>
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4) Analysis and discussion of data	From the above data, it is very clear only 15 out of 35 students (43%) are considered competent to write a mechanism. About 14 students (40%) are at the developing level and 6 students (17%) are at the beginning level. This class requires competency level to allow the students to move to the next level. We would consider that only 43% of the students achieved that particular SLO.
5) How your EMP and DPP planning process will utilize what was learned through the analysis of your program's assessment of learning outcomes	This result shows a lack of understanding of reaction mechanisms and how they work. We need to shift more students to the competent level. Our approach would be to provide more practice problems in terms of mechanistic reasonaning.

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<table>
<tr><td>*1) Outcome to be assessed by dept members</td><td>C- Follow published reaction protocols to synthesize, isolate, purify and characterize compounds using standard laboratory equipment and modern instrumentation then interpret laboratory results</td></tr>
<tr><td>2) Means of assessment and criteria of success</td><td>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.</td></tr>
<tr><td>3) Summary of data collected</td><td>Two sections were assessed with 34 students.
<table>
<tr><th></th><th>Beginning
1</th><th>Developing
2</th><th>Competent
3</th><th>Accomplished
4</th></tr>
<tr><td>Purpose</td><td>1 student (3%)</td><td>3 students (9%)</td><td>1 student (3%)</td><td>29 students (85%)</td></tr>
<tr><td>Reaction and Mechanism</td><td>-------</td><td>5 students (15%)</td><td>2 students (6%)</td><td>27 students (79%)</td></tr>
<tr><td>Physical data table with theoretical yield</td><td>1 student (3%)</td><td>3 students (9%)</td><td>13 Students (38%)</td><td>17 students (50%)</td></tr>
<tr><td>Procedure</td><td>------</td><td>-------</td><td>------</td><td>34 students (100%)</td></tr>
<tr><td>Observation and data (observation, masses, m.p. and IR/GC)</td><td>------</td><td>6 students (18%)</td><td>7 students (21%)</td><td>21 students (61%)</td></tr>
<tr><td>Calculations</td><td>-----</td><td>7 students (21%)</td><td>7 students (21%)</td><td>20 students (58%)</td></tr>
<tr><td>Analysis (yield, m.p., purity, GC/IR)</td><td>-----</td><td>5 students (15%)</td><td>4 students (12%)</td><td>25 students (73%)</td></tr>
<tr><td>Post lab questions</td><td>5 students (15%)</td><td>2 students (6%)</td><td>7 students (21%)</td><td>20 students (58%)</td></tr>
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4) Analysis and discussion of data	From the above data, it is very clear that about 80% of the students are competent or above in writing laboratory reports. We can safely say that 80% of our students achieved SLO C for this course.
5) How your EMP and DPP planning process will utilize what was learned through the analysis of your program's assessment of learning outcomes	This result shows that we are preparing our students well to perform the experiment, collect data and analyze the data. This is a result of writing so many laboratory reports throughout the whole semester.