The ACS standardized exam test student learning outcomes 1-4 for the year-long Organic Chemistry series and allows us to compare our students' performance to students nationwide who have completed a year-long undergraduate series of courses in organic chemistry. Our goal is for our students to be at or above the 40th percentile in the nation. In 2015, 10/28 of our Chemistry and Biochemistry accomplished this goal. 4/28 of our majors were at or above the 70th percentile which we consider outstanding. Analysis of the most frequently missed questions by our chemistry and biochemistry students determined that the most problematic areas were in recognizing intermediates of reactions and putting together multi-step reaction sequences. The instructors of the course will keep this in mind during the next year and give more emphasis to the theory and application of these areas.

Correct identification of two unknown compounds during the Organic Chemistry Capstone Experience for 2015 is shown in the following table:

the lab instructor to orally defend their process and conclusions, at which point they also get feedback from the instructor. At the end of the experiment students write a lab report which includes a substantial analysis of the data they collected to explain how their results support their conclusions. Having 96 % of the chemistry and biochemistry majors able to satisfactorily complete the process and identify at least one of their unknowns leads us to believe that student learning objectives in the Organic Chemistry lab are being met.

In an on-going effort to improve our students' success in meeting the student learning outcomes, we compare the results of this years' assessment data with previous years. As shown in the following graph and table, the results of this year's lecture assessment is an improvement over the most recent years, although not the best that we have achieved. The results of this year's

Year	# of Chem/Biochem Majors	# with both correct		# with at least one correct	
Sp 2004	18	13		17	

Embedded Question	SLO #	# of undergrads Students	# of students with

6) be able to describe the nature of the electron in the hydrogen atom.
7) be able to describe the building up of the periodic table by electron configuration.
8) be able to correlate the changes observed in spectroscopic methods in terms of quantum theory.
9) understand the importance of rates of chemical reactions in the overall scheme of chemistry.
10) be able to calculate reaction order from the time dependence on concentration.
11) be able to understand and describe transition state theory.
12) understand the nature of solids in terms of their nature, bonding, and properties.
13) understand how statistics and probability can be used to develop thermodynamic concepts.

For CHEM 3511, Student Learning Outcomes 1, 3, and 4 were assessed through the use of eight embedded questions in the final exam, three free response, two multiple choice, and three true-false type questions. The results were sorted by major.

BS Chemistry (16 students)

Question	Number (Percent) of students receiving at least			
	25%	50%	75%	100%
Q1	14 (87.5%)	11 (68.8%)	2 (12.5%)	2 (12.5%)
Q2	16 (100%)	15 (93.8%)	3 (18.8%)	3 (18.8%)
Q3	13 (81.3%)	10 (62.5%)	6 (37.5%)	1 (6.3%)
MC13				12 (75.0%)
MC15				

TF8		

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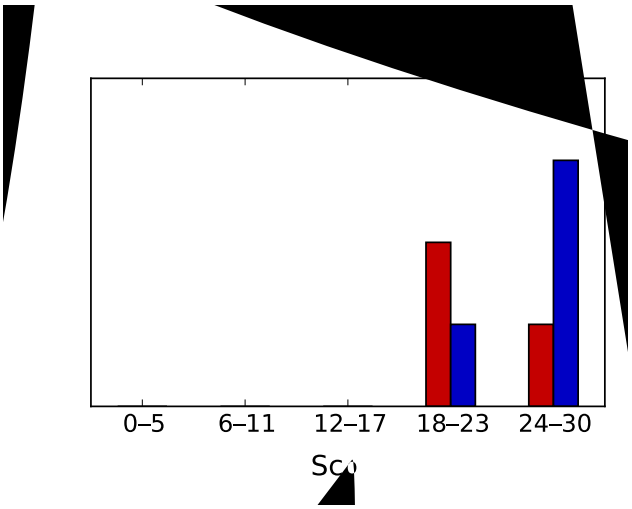

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