

## Chemistry Department Assessment of GE Learning Outcome 1e

**Learning Outcome:** GELO 1e. Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature.

**Outcome Measure:** Problems on the final exam that are quantitative in nature.

CHE101 Chemistry and Society

CHE103 Introduction to General, Organic, and Biological Chemistry

CHE152 General Chemistry I

PSC110 Physical Science (chemistry portion)

PSC111 Physical Science for Teachers (chemistry portion)

**Criteria for Success:** At least 70% of students will score 3 or higher.

### Longitudinal Data:

Course	Semester	N	% students score = 4	% students score = 3	% students score = 2	% students score = 1
CHE101	Spring 2015	22	45.5%	31.8%	13.6%	9.1%
CHE101	Spring 2016	20	45.0%	35.0%	0.0%	20.0%
CHE101	Spring 2017	17	52.9%	35.3%	5.9%	5.9%
CHE101	Spring 2018	19	15.8%	42.1%	31.6%	10.5%
CHE103	Fall 2014	26	73.1%	23.1%	3.8%	0%
CHE103	Spring 2015	16	50.0%	18.8%	25.0%	6.3%
CHE103	Fall 2015	24	80.8%	11.5%	3.8%	3.8%
CHE103	Spring 2016	19	63.2%	10.5%	15.8%	10.5%
CHE103	Fall 2016	34	73.5%	23.5%	0.0%	0.0%
CHE103	Spring 2017	20	50.0%	35.0%	15.0%	0.0%
CHE103	Fall 2017	30	80.0%	6.7%	13.3%	0.0%
CHE103	Spring 2018	20	45.0%	20.0%	25.0%	10.0%
CHE152	Fall 2014	40	50.0%	30.0%	12.5%	7.5%
CHE152	Fall 2015	48	56.3%	22.9%	18.8%	2.1%
CHE152	Fall 2016	55	69.1%	20.0%	1.8%	9.1%
CHE152	Fall 2017	51	70.6%	13.7%	11.8%	3.9%
PSC110	Fall 2014	22	40.9%	22.7%	13.6%	22.7%
PSC110	Spring 2015	22	45.5%	22.7%	22.7%	9.1%
PSC110	Fall 2015	20	40.0%	15.0%	25.0%	20.0%
PSC110	Spring 2016	20	80.0%	15.0%	0.0%	5.0%
PSC110	Fall 2016	20	65.0%	30.0%	5.0%	0.0%
PSC110	Spring 2017	18	88.9%	5.6%	5.6%	0.0%
PSC111	Fall 2017	20	65.0%	25.0%	10.0%	0.0%

Course	Semester	N	% students score 3 or higher
CHE101	Spring 2015	22	77.3%
CHE101	Spring 2016	20	80.0%
CHE101	Spring 2017	17	88.2%
CHE101	Spring 2018	19	57.9%
CHE103	Fall 2014	26	96.2%
CHE103	Spring 2015	16	68.8%

CHE103	Fall 2015	24	92.3%
CHE103	Spring 2016	19	73.7%
CHE103	Fall 2016	34	100.0%
CHE103	Spring 2017	20	85.0%
CHE103	Fall 2017	30	86.7%
CHE103	Spring 2018	20	65.0%
CHE152	Fall 2014	40	80.0%
CHE152	Fall 2015	48	79.2%
CHE152	Fall 2016	55	89.1%
CHE152	Fall 2017	51	84.3%
PSC110	Fall 2014	22	63.6%
PSC110	Spring 2015	22	68.2%
PSC110	Fall 2015	20	55.0%
PSC110	Spring 2016	20	95.0%
PSC110	Fall 2016	20	95.0%
PSC110	Spring 2017	18	94.4%
PSC111	Fall 2017	20	90.0%

**Conclusions Drawn from Data:** All of the students who were assessed were a random sampling from one or more sections of each course except for the CHE103 spring semester sections which assessed the entire class. The criteria for success were met in 17 out of 23 of our GE courses during the 2014-2015, 2015-2016, 2016-2017, and 2017-2018 academic years. Two courses were just below the 70% mark at 68.8% and 68.2%. PSC110 Fall 2014 and Fall 2015 were lower at 63.6% and 55.0%, respectively. In Fall 2015, some factors such as different exam formats from the first half of the course (Physics portion, all multiple choice) to the second half of the course (Chemistry portion, multiple choice and short answer) may have contributed because only short answer problems were used for assessment. A dramatic improvement was observed for PSC110 in Spring 2016, Fall 2016, and Spring 2017. In Spring 2018, CHE101 and CHE103 were at 57.9% and 65.0%, respectively, which seem outside of trends from previous semesters.

**Changes to be Made Based on Data:** We will continue to keep an eye on the performance in these courses to determine if quantitative reasoning needs to be further developed.

**Rubric Used:** The following scale will be used.

	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>% of points earned on quantitative problems</b>	80 – 100%	60 – 79%	40 – 59%	39% or lower