

### Learning Outcome: FELO 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 / 1001 Chemistry and Society

CHE103 / 1003 Introduction to General, Organic, and Biological Chemistry

CHE152 / 1052 General Chemistry I

PSC110 Physical Science (chemistry portion)

PSC111 / 1014 Physical Science for Teachers (chemistry portion)

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

**Longitudinal Data:**

#### **CHE1001 (formerly CHE101)**

	<b>Assessment Data for FELO 1e. Quantitative Reasoning</b>									
	<b>Fall 2018</b>	<b>Spring 2019</b>	<b>Fall 2019</b>	<b>Spring 2020</b>	<b>Fall 2020</b>	<b>Spring 2021</b>	<b>Fall 2021</b>	<b>Spring 2022</b>	<b>Fall 2022</b>	<b>Spring 2023</b>
<b>Number of students</b>	n=20	n=20	n=19	n=20	n=18	n=19	N/A	n=20	n=20	n=20
<b>Percentage</b>	50.0%	55.0%	47.4%	75.0%	77.8%	55.0%	Course not offered	70%	20%	55%

#### **CHE1003 (formerly CHE103)**

	<b>Assessment Data for FELO 1e. Quantitative Reasoning</b>									
	<b>Fall 2018</b>	<b>Spring</b>	<b>Fall 2019</b>	<b>Spring</b>	<b>Fall 2020</b>	<b>Spring</b>	<b>Fall 2021</b>	<b>Spring 2022</b>	<b>Fall 2022</b>	<b>Spring 2023</b>

		2019		2020		2021				
<b>Number of students</b>	n=40	NA	n=29	n=20	n=33	n=19	n= 34	N/A	n=31	n=20
Percentage	90.0%	NA	89.7%	90.0	90.9%	47.4%	82.9%	Not assessed	65%	73.7%

\*No assessment data for FELO 1e in CHE103 Spring 2019 and Spring 2022, due to changes made to final exam.

p.6

Chemistry: FELO Data, 2022-23

**CHE1052 (formerly CHE152)**

	<b>Assessment Data for FELO 1e. Quantitative Reasoning</b>								
	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022
<b>Number of students</b>	n=40	n=48	n=55	n=51	n=52	n=48	n=47	n= 45	n=47
Percentage	80.0%	79.2%	89.1%	84.3%	96.2%	83.0%	76.6%	32.6%	77.8%

**PSC1014 (formerly PSC110 & PSC111)**

	<b>Assessment Data for FELO 1e. Quantitative Reasoning</b>								
	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022
<b>Number of students</b>	n=20	n=20	n=18	n=20	n=19	n=20	n=20	n=19	n=20

Percentage	95.0%	95.0%	94.4%	90.0%	63.2%	85.0%	70.0%	78.9%	78.9%
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**Conclusions Drawn from Data:** FELO 1e (quantitative reasoning) is assessed in 4 of our 5 chemistry FE courses. For General Chemistry I (CHE 1052) our criteria for success was met. This is encouraging in light of the fact that in 2021, we had the lowest score for this course. We had attributed this low score to lack of preparation with COVID and the fact that we had used multiple choice questions. This year, we returned to using short answer questions on the final exam and that seemed to have solved the problem. The criteria for success was not met for Chemistry and Society (CHE 1001) both in the Fall semester and in the Spring semester though during the Spring semester the score improved dramatically from the Fall. We will continue to monitor this course and see if this is a one off or a trend. Regarding PSC 1014 and CHE 1003, the criteria for success were met (though not in the Fall for CHE 1003).

**Changes to be Made Based on Data:** The chemistry department now has an agreed upon set of questions for each course. This has been used for the first time this year and has proven helpful in CHE 1052. We do not plan on making further changes at this point as we expect some fluctuation from time to time.

p.7

Chemistry: FELO Data, 2022-23

**Rubric Used:** The following scale was 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

p.8