Biology

GELOs in Biology Courses, Sp 2026

A. PLNU General Education courses (BIO 1001, 1002, 1003, 1005, 2010 & 2011)

FELO 1d: Critical Thinking

Students will be able to examine, critique and synthesize information in order to arrive at reasoned conclusions. This outcome will be measured yearly via direct, summative assessment.

Outcome Measure: Signature Assignment: Multiple choice questions on the final exam taken from the Test of Scientific Literacy Skills (TOSLS). The whole class was assessed.

Criteria for Success: For BIO1001, 1002, 1003, 1005, 2010, and 2011, at least 60% of the students will answer the questions correctly (an average of 60% for all of the questions). 60% was chosen since these are all introductory courses. BIO2010 and BIO2011 are freshmen courses for all Biology Department majors and also service courses for Allied Health majors. BIO1001, 1002, 1003, and 1005 are General Biology courses for all other majors. Questions from the TOSLS were chosen that specifically addressed critical thinking and were appropriate for the content of each course.

Longitudinal Data:

	Spring, 2026		Fall, 2025		Spring, 2025		Fall, 2024	
Class	**n**	**% of Students Answering TOSLS Questions Correctly (Ave)**	**n**	**% of Students Answering TOSLS Questions Correctly (Ave)**	**n**	**% of Students Answering TOSLS Questions Correctly (Ave)**	**n**	**% of Students Answering TOSLS Questions Correctly (Ave)**
BIO1001		Adjunct		Adjunct	43	75	28	74±11
BIO1002		Not Offered	68	62		Not offered		Not offered
BIO1003	46	73	48	77	46	70	45	73 ±13
BIO1005		ND		ND		ND	43	72 ±7
BIO2010	61	83	75	85	83	77	76	83±10
BIO2011		ND		ND	40	75	63	78 ± 13

Conclusions Drawn from Data: The students in the various GE courses are meeting the criteria for critical thinking. Gaps is data are the responsibility of the Associate Dean. Collection of data was poor in real time, and adjuncts were not informed to collect such data.

Changes to be Made Based on Data: We will continue to use these questions for summative assessment in our GE courses.

Rubric:

Gormally, C., Brickman, P., and Lutz, M. "Developing a Test of Scientific Literacy Skills (TOSLS): Measuring Undergraduates' Evaluation of Scientific Information and Arguments." C.B. E. Life Science Education 11(4): 364–377 (2012).

BIO1001: Questions 1, 4, 6, 7, 8, 11, 12, 13, 14, 18, 28
BIO1002: Questions 2, 6, 18, 28
BIO1003: Questions 4, 6, 7, 8, 11, 12, 13, 14, 18, 28
BIO1005: Questions 2, 6, 18, 28
BIO2010: Questions 1, 2, 7, 8, 11, 18, 19, 24, 25
BIO2011: Questions 2, 6, 18, 28

B. PLNU General Education course (BIO 1004)

FELO 1c: Information Literacy

Students will be able to access and cite information as well as evaluate the logic, validity, and relevance of information from a variety of sources. This outcome will be measured yearly via direct, summative assessment.

Outcome Measure: Signature Assignment: Multiple choice questions on the final exam taken from the Test of Scientific Literacy Skills (TOSLS). The whole class was assessed.

Criteria for Success: At least 60% of the students will answer the questions correctly (an average of 60% for all of the questions). 60% was chosen since this is an introductory course for non-science majors. Questions from the TOSLS were chosen that specifically addressed information literacy and were appropriate for the content of each course.

Longitudinal Data:

	Spring, 2026		FALL, 2022		FALL, 2019	
Class	**n**	**% of Students Answering TOSLS Questions Correctly (Ave)**	**n**	**% of Students Answering TOSLS Questions Correctly (Ave)**	**n**	**% of Students Answering TOSLS Questions Correctly (Ave)**
BIO1004	24	92	23	82	43	83

Conclusions Drawn from Data: The students in BIO1004 was not offered in Spring 2025. Previously, however, these students were meeting the criteria for information literacy. These data were not collected in 2020 - 2021 due to COVID.

Changes to be Made Based on Data: We will continue to use these questions for summative assessment in our GE courses.

Rubric: Gormally, C., Brickman, P., and Lutz, M. "Developing a Test of Scientific Literacy Skills (TOSLS): Measuring Undergraduates' Evaluation of Scientific Information and Arguments." C.B. E. Life Science Education 11(4): 364–377 (2012).

BIO1004: Questions 5, 9, 10, 17, 22, 27