

Program Mission[CSUEB Mission Statement and Strategic Planning](#)**Program Learning Outcomes**

Students graduating with an M.S. in Biological Sciences from Cal State East Bay will be able to:

<i>PLO1</i>	Demonstrate a broad and sophisticated understanding that contributes to biological concepts and principles across all levels of biological organization, from ions to ecosystems.
<i>PLO2</i>	Demonstrate expertise in a specific area of biological science.
<i>PLO3</i>	Independently apply the scientific method to formulate testable biological hypotheses, analyze empirical data, and synthesize the results of the analysis.
<i>PLO4</i>	Clearly communicate the design and results of an observational or experimental analysis in a variety of formats, including the graduate thesis, scientific paper, scientific poster, and oral presentation.
<i>PLO5</i>	Gather and evaluate primary scientific literature and judge the value of the information presented in relation to particular biological questions.

Assessment Plan: MS in Biological Sciences

Date Updated: 9/24/2021

To be Done Annually	
1. Which PLO(s) to assess?	PLOs 2-5
2. Is it aligned to an ILO?	Yes
3. If yes, which ILO?	ILOs 1, 2 and 6
4. Course number?	BIOL 691, University Thesis
5. SLO from course	PLOs 2-5
6. Assessment activity	We plan to apply the Oral Defense Rubric created by Maria Gallegos and inspired by the VALUE RUBRICS developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. Our version of the VALUE RUBRIC is designed to assess all five PLOs simultaneously.
7. Assessment Instrument	The Oral Defense Rubric (See attached).

8. <i>How data will be reported</i>	Data will be reported in graph form each year in the CAPR report.
9. <i>Responsible Persons</i>	Each Thesis Committee
10. <i>When assessed</i>	At the time of the Oral Defense
11. <i>Ways of closing the loop</i>	Faculty will use the assessment results to inform any curriculum changes, pedagogical improvements, revised course student learning outcomes, and refined programmatic student learning outcomes as needed. Assessment tools will also be refined as needed.

To be Done Annually	
12. <i>Which PLO(s) to asses?</i>	PLO 1
13. <i>Is it aligned to an ILO?</i>	Yes
14. <i>If yes, which ILO?</i>	ILO 6
15. <i>Course number?</i>	BIOL 691, University Thesis
16. <i>SLO from course</i>	PLO 1
17. <i>Assessment activity</i>	We plan to administer an online assessment of general knowledge at the beginning of the semester during the required seminar course.
18. <i>Assessment Instrument</i>	An online assessment developed by faculty to include questions from each broad area of Biology: Cell and Molecular Biology,
19. <i>How data will be reported</i>	Results of the assessment will be reported in graph form each year in the CAPR report.
20. <i>Responsible Persons</i>	Graduate Advisor and Thesis Committee.
21. <i>When assessed</i>	Beginning of semester of thesis defense.
22. <i>Ways of closing the loop</i>	Faculty will use the assessment results to inform any curriculum changes, pedagogical improvements, revised course student learning outcomes, and refined programmatic student learning outcomes as needed. Assessment tools will also be refined as needed.

Planned Assessment Tools:

PLO 1. An online assessment of general knowledge.

PLO 2-5. Oral Defense scored with standardized rubric by thesis committee.

Sample Questions for the Online Assessment (from the Cell and Molecular Biology component):

Before an RNA transcript leaves the nucleus, it is modified in one or more ways. List in approximate order all the modifications that most RNA transcripts are subject to. *

Long answer text

In a few sentences, describe why telomerase is important to the cell and how it performs its function. *

Long answer text

The following is an image of a metaphase spread whereby mitotically dividing cells were first arrested at metaphase (by a drug). Then cell membranes were ruptured to release the DNA from within the nuclei. How many DNA molecules are found within the red circle? *



- one double-stranded DNA molecule.
- two double-stranded DNA molecules.
- four double-stranded DNA molecules

Briefly describe the path of a secreted protein. Start at **where it is manufactured**. List each region/compartment of the cell that this protein passes on its way to the extracellular space. *

Short answer text

Assessment of PLOs using Oral Material (Poster, Seminar and/or Oral Defense)

Student Name: _____

Net or empl ID: _____

Assessment completed by: _____

Relation to Student (i.e. Instructor, PI, committee member): _____

Signature (when complete): _____ Date: _____

Assessment Type (check one):

Poster Presentation

Graduate Seminar (Course: _____)

Oral Defense Practice Seminar

Oral Defense Seminar (outcome: Pass Fail Conditional Pass

Conditions that need to be met:

Program Learning Outcomes:

1. Demonstrate a broad and sophisticated understanding that contributes to biological concepts and principles across all levels of biological organization, from ions to ecosystems.
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3. Independently apply the scientific method to formulate testable biological hypotheses, analyze empirical data, and synthesize the results of the analysis.
4. Clearly communicate the design and results of an observational or experimental analysis in a variety of formats, including the graduate thesis, scientific paper, scientific poster, and oral presentation.

5. Gather and evaluate primary scientific literature and judge the value of the information presented in relation to particular biological questions.

A description of an exemplary score is provided for each criteria listed below. An exemplary score is obtained for a given criteria when the description is true. A proficient score is obtained when the description is mostly true. A basic score is obtained when the description is somewhat true. *Scores: 4 = Exemplary / Mastery, 3 = Proficient, 2 = Basic, 1 = Minimal. *The rubrics below are modified from the VALUE RUBRICS.*

ORAL COMMUNICATION RUBRIC (PLOs 2,4,5):

Criteria	Capstone / Mastery	SCORE*	PLO
Organization of the Presentation	The introduction, approach, results and conclusions are sequenced skillfully. Overall, the content of the presentation is cohesive with seamless transitions.		4
Language	Uses language appropriate to the discipline as well as the audience. Discipline specific jargon is minimized or clearly defined.		2, 4, 5
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling. Speaker is polished and confident.		4
Supporting Material	Supporting material (illustrations, analogies etc) are relevant to the presentation and central message and establish the presenter's authority on the topic.		5
Central Claim(s)	Main claim is clear and compelling (precisely stated, appropriately repeated, memorable, and supported with evidence).		4

INQUIRY AND ANALYSIS RUBRIC (PLO 3):

Criteria	Capstone / Mastery	SCORE*	PLO
Hypothesis/Question <i>(not used for Thesis Defense)</i>	Develops a creative, manageable and testable hypothesis or question related to a topic that is significant yet poorly understood.		3
Background Knowledge	Synthesizes relevant information from reliable sources. Answers questions accurately.		2
Experimental Design	Develops methodology that is appropriate and clearly outlined. Includes proper controls.		3
Accurate Analysis	Performs an accurate analysis of the evidence to reveal the presence or absence of patterns related to the hypothesis/question.		3
Conclusions	States a conclusion that is a logical extrapolation from the evidence outlined.		3
Recognizes Limitations and Implications	Insightfully discusses relevant and supported (if possible) caveats, limitations and implications.		3

