2014-2015 Annual Assessment Report Template v16

FOR GRADUATE AND CREDENTIAL PROGRAMS: THIS TEMPLATE REFERS TO SAC STATE BACCALAUREATE LEARNING GOALS. PLEASE IGNORE THESE REFERENCES IN YOUR REPORT.

Question 1: Program Learning Outcomes

Q1.1. Which of the following Program Learning Outcomes (PLOs) and Sac State Baccalaureate Learning Goals (BLGs) **did you assess in 2014-2015**? **[Check all that apply]**

- [X] 1. Critical thinking
- [ ] 2. Information literacy
- [ ] 3. Written communication
- [ ] 4. Oral communication
- [ ] 5. Quantitative literacy
- [ ] 6. Inquiry and analysis
- [ ] 7. Creative thinking
- [ ] 8. Reading
- [ ] 9. Team work
- [ ] 10. Problem solving
- [ ] 11. Civic knowledge and engagement
- [ ] 12. Intercultural knowledge and competency
- [ ] 13. Ethical reasoning
- [ ] 14. Foundations and skills for lifelong learning
- [ ] 15. Global learning
- [ ] 16. Integrative and applied learning
- [ ] 17. Overall competencies for GE Knowledge
- [ ] 18. Overall competencies in the major/discipline
- [ ] 19. Other, specify any PLOs that were assessed in 2014-2015 but not included above:
  - a.
  - b.
  - c.

Q1.3. Are your PLOs closely aligned with the mission of the university?

- [X] 1. Yes
- [ ] 2. No
- [ ] 3. Don't know

Q1.4. Is your program externally accredited (other than through WASC)?

- [ ] 1. Yes
- [X] 2. No (Go to **Q1.5**)
- [ ] 3. Don't know (Go to **Q1.5**)

Q1.4.1. If the answer to Q1.4 is yes, are your PLOs closely aligned with the mission/goals/outcomes of the accreditation agency?

- [ ] 1. Yes
- [ ] 2. No
- [ ] 3. Don't know

Q1.5. Did your program use the *Degree Qualification Profile* (DQP) to develop your PLO(s)?

- [ ] 1. Yes
- [X] 2. No, but I know what the DQP is
- [ ] 3. No, I don't know what the DQP is.
- [ ] 4. Don't know

Q1.6. Did you use action verbs to make each PLO measurable (See Attachment I)?

Yes

Q1.2. Please provide more detailed background information about **EACH PLO** you checked above and other information such as how your specific PLOs were **explicitly** linked to the Sac State BLGs:

Critical thinking falls under intellectual and practical skills in the Baccalaureate Learning Goals.

Q1.2.1. Do you have rubrics for your PLOs?

- [ ] 1. Yes, for all PLOs
- [X] 2. Yes, but for some PLOs
- [ ] 3. No rubrics for PLOs
- [ ] N/A, other (please specify):

IN QUESTIONS 2 THROUGH 5, REPORT IN DETAIL ON ONE PLO THAT YOU ASSESSED IN 2014-2015

Question 2: Standard of Performance for the selected PLO

Q 2.1. Specify one PLO here as an example to illustrate how you conducted assessment (be sure you checked the correct box for this PLO in Q1.1):

Critical Thinking. Students will state a testable hypothesis, provide and interpret background information in a coherent summary (evidence), recognize the complexities of the hypothesis and acknowledge opposing viewpoints (position/perspective), and provide a conclusion that is logically tied to the information provided (conclusions and related outcomes).

Q2.2. Has the program developed or adopted **explicit** standards of performance for this PLO?

- [ ] 1. Yes
- [X] 2. No
- [ ] 3. Don't know
- [ ] 4. N/A

Q2.3. **Please provide the rubric(s)** and standard of performance that you have developed for this PLO here or in the appendix: **[Word limit: 300]**

See Appendix 2.

Q2.4. Please indicate the category in which the selected PLO falls into.

- [X] 1. Critical thinking
- [ ] 2. Information literacy
- [ ] 3. Written communication
- [ ] 4. Oral communication
- [ ] 5. Quantitative literacy
- [ ] 6. Inquiry and analysis
- [ ] 7. Creative thinking
- [ ] 8. Reading
- [ ] 9. Team work
- [ ] 10. Problem solving
- [ ] 11. Civic knowledge and engagement
- [ ] 12. Intercultural knowledge and competency
- [ ] 13. Ethical reasoning
- [ ] 14. Foundations and skills for lifelong learning
- [ ] 15. Global learning
- [ ] 16. Integrative and applied learning
- [ ] 17. Overall competencies for GE Knowledge
- [ ] 18. Overall competencies in the major/discipline
- [ ] 19. Other:

Please indicate where you have published the PLO, the standard of performance, and the rubric that measures the PLO:	Q2.5 (1) PLO	Q2.6 (2) Standards of Performance	Q2.7 (3) Rubrics
1. In **SOME** course syllabi/assignments in the program that address the PLO	X		
2. In **ALL** course syllabi/assignments in the program that address the PLO			
3. In the student handbook/advising handbook			
4. In the university catalogue			
5. On the academic unit website or in newsletters			
6. In the assessment or program review reports, plans, resources or activities	X		X
7. In new course proposal forms in the department/college/university	X		
8. In the department/college/university's strategic plans and other planning documents			

9. In the department/college/university's budget plans and other resource allocation documents			
10. Other, specify:			

Question 3: Data Collection Methods and Evaluation of Data Quality for the Selected PLO

Q3.1. Was assessment data/evidence **collected** for the selected PLO in 2014-2015?

- [X] 1. Yes
- [ ] 2. No (Skip to **Q6**)
- [ ] 3. Don't know (Skip to **Q6**)
- [ ] 4. N/A (Skip to **Q6**)

Q3.2. If yes, was the data **scored/evaluated** for this PLO in 2014-2015?

- [X] 1. Yes
- [ ] 2. No (Skip to **Q6**)
- [ ] 3. Don't know (Skip to **Q6**)
- [ ] 4. N/A (Skip to **Q6**)

Q3.1A. How many assessment tools/methods/measures **in total** did you use to assess this PLO?

One in the current academic year.

Q3.2A Please describe how you collected the assessment data for the selected PLO. For example, in what course(s) or by what means were data collected (see Attachment II)? **[Word limit: 300]**

Data were collected in Bio 188 (Evolution). This is a course that serves as a capstone course for students with no concentration in both the BA and BS degree programs. Furthermore, this course is taken as a required course by students in two concentrations and as an elective course in several other concentrations. Within the course, a culminating paper that was submitted for a grade in the course was evaluated for critical thinking using a modification of the VALUE critical thinking rubric (Appendix 2). The Department offers two sections of this course every semester with approximately 40 students per section. Data for the current assessment report was collected from 15 randomly-sampled student papers from Spring 2014 from Section 02 and 15 randomly sampled papers from Fall 2014 from Section 02. Fifteen papers per section were randomly selected for the Departmental assessment for a total of 30 papers. Thirteen volunteers from the full-time faculty and instructional support staff in Biological Sciences evaluated papers. All volunteers were educated about the rubric and normed using two example papers prior to data collection. Each paper was read two times to ensure inter-rater reliability, and the scores were averaged for analyses. For papers that differed by a score of more than one in any rubric dimension, a third evaluation was performed and the mean of all three evaluations was taken for the final score.

Q3A: Direct Measures (key assignments, projects, portfolios)

Q3.3. Were direct measures [key assignments, projects, portfolios, etc.] used to assess this PLO?

- [X] 1. Yes
- [ ] 2. No (Go to **Q3.7**)
- [ ] 3. Don't know (Go to **Q3.7**)

Q3.3.1. Which of the following direct measures were used? **[Check all that apply]**

- [ ] 1. Capstone projects (including theses, senior theses), courses, or experiences
- [X] 2. Key assignments from required classes in the program
- [ ] 3. Key assignments from elective classes
- [ ] 4. Classroom based performance assessments such as simulations, comprehensive exams, critiques
- [ ] 5. External performance assessments such as internships or other community based projects
- [ ] 6. E-Portfolios
- [ ] 7. Other portfolios
- [ ] 8. Other measure. Specify:

Q3.3.2. Please attach the direct measure you used to collect data.

See Appendix 1 for the paper prompt and Appendix 2 for the modified VALUE rubric.

Q3.4. How was the data evaluated? **[Select only one]**

- [ ] 1. **No** rubric is used to interpret the evidence (Go to **Q3.5**)
- [ ] 2. Used rubric developed/modified by the faculty who teaches the class
- [ ] 3. Used rubric developed/modified by a group of faculty
- [ ] 4. Used rubric pilot-tested and refined by a group of faculty
- [ ] 5. The VALUE rubric(s)
- [X] 6. Modified VALUE rubric(s)
- [ ] 7. Used other means. Specify:

Q3.4.1. Was the direct measure (e.g. assignment, thesis, etc.) aligned directly and explicitly with the PLO?

- [X] 1. Yes
- [ ] 2. No
- [ ] 3. Don't know
- [ ] 4. N/A

Q3.4.2. Was the direct measure (e.g. assignment, thesis, etc.) aligned directly and explicitly with the rubric?

- [X] 1. Yes
- [ ] 2. No
- [ ] 3. Don't know
- [ ] 4. N/A

Q3.4.3. Was the rubric aligned directly and explicitly with the PLO?

- [X] 1. Yes
- [ ] 2. No
- [ ] 3. Don't know
- [ ] 4. N/A

Q3.5. How many faculty members participated in planning the assessment data collection of the selected PLO?

Three faculty were involved in planning the assessment process. Data collection was performed by a group of faculty and staff volunteers with a total of 13 participants.

Q3.5.1. If the data was evaluated by multiple scorers, was there a norming process (a procedure to make sure everyone was scoring similarly)?

- [X] 1. Yes
- [ ] 2. No
- [ ] 3. Don't know

Q3.6. How did you **select** the sample of student work [papers, projects, portfolios, etc.]?

Papers were selected at random from one of two sections of Bio 188 each from spring 2014 and Fall 2014. Only sections of the course where papers were submitted through SacCT were used so that unmarked copies of student work could be used for the program assessment. Within each section, 15 papers were chosen at random by sorting by student ID and randomly selecting 15 from 30-40 total students within the class using random number lists generated by random.com. Thirty papers were chosen in total for this process.

Q3.6.1. How did you **decide** how many samples of student work to review?

This was determined based on the number of volunteers that were available to read student work. The goal was to have each volunteer read no more than six papers.

Q3.6.2. How many students were in the class or program?

40 per class section X 2 sections per semester = approx. 160 per academic year.

Q3.6.3. How many samples of student work did you evaluate?

30

Q3.6.4. Was the sample size of student work for the direct measure adequate?

- [X] 1. Yes
- [ ] 2. No
- [ ] 3. Don't know

Q3B: Indirect Measures (surveys, focus groups, interviews, etc.)

Q3.7. Were indirect measures used to assess the PLO?

- [ ] 1. Yes
- [X] 2. No (Skip to **Q3.8**)
- [ ] 3. Don't know

Q3.7.1. Which of the following indirect measures were used? **[Check all that apply]**

- [ ] 1. National student surveys (e.g., NSSE)
- [ ] 2. University conducted student surveys (e.g. OIR)
- [ ] 3. College/Department/program student surveys
- [ ] 4. Alumni surveys, focus groups, or interviews
- [ ] 5. Employer surveys, focus groups, or interviews
- [ ] 6. Advisory board surveys, focus groups, or interviews
- [ ] 7. Other, specify:

Q3.7.2 If surveys were used, how was the sample size decided?

Q3.7.3. If surveys were used, briefly specify how you selected your sample.

Q3.7.4. If surveys were used, what was the response rate?

Q3C: Other Measures (external benchmarking, licensing exams, standardized tests, etc.)

Q3.8. Were external benchmarking data such as licensing exams or standardized tests used to assess the PLO?

- [ ] 1. Yes
- [X] 2. No (Go to **Q3.8.2**)
- [ ] 3. Don't know

Q3.8.1. Which of the following measures were used?

- [ ] 1. National disciplinary exams or state/professional licensure exams
- [ ] 2. General knowledge and skills measures (e.g., CLA, CAAP, ETS PP, etc.)
- [ ] 3. Other standardized knowledge and skill exams (e.g., ETS, GRE, etc.)
- [ ] 4. Other, specify:

Q3.8.2. Were other measures used to assess the PLO?

- [X] 1. Yes
- [ ] 2. No (Go to **Q3.9**)
- [ ] 3. Don't know (Go to **Q3.9**)

Q3.8.3. If other measures were used, please specify:

The Critical Thinking Assessment Test (https://www.tntech.edu/cat) was administered in both introductory (Bio 1) and intermediate-level (Bio 100) courses within the Biological Sciences major. The Department also plans to administer this instrument in an advanced-level class (Bio 188) in Fall 2015. This instrument is being used to assess the effectiveness of research experiences in the classroom in improving critical thinking skills (National Science Foundation-funded SIRIUS project). The results of this assessment will be reported next year in the Annual Assessment report.

Q3D: Alignment and Quality

Q3.9. Did the data, including the direct measures, from all the different assessment tools/measures/methods directly align with the PLO?

- [X] 1. Yes
- [ ] 2. No
- [ ] 3. Don't know

Q3.9.1. Were **ALL** the assessment tools/measures/methods that were used good measures for the PLO?

- [X] 1. Yes
- [ ] 2. No
- [ ] 3. Don't know

Question 4: Data, Findings and Conclusions

Q4.1. Please provide simple tables and/or graphs to summarize the assessment data, findings, and conclusions: (see Attachment III) **[Word limit: 600 for selected PLO]**

Students scored between 1 and 3 for all three of the rubric dimensions measured. No student work was scored as a 4 in any of the rubric dimensions. The mean score for students in all three categories was between a 1 and 2 (Table 1). However, these means are not particularly meaningful with regard to student performance because they do not indicate the distribution of student scores. When considering the percentage of students scoring 2 or higher for each rubric dimension, we found that 23% of students scored a 2 or higher for student's position (or hypothesis), 33% scored 2 or higher on evidence, and 37% scored 2 or higher on conclusions (Figure 1). When considering the percentage of students who scored 3 or higher for all three dimensions, we found that only 7% of students overall scored 3 or higher for student's position (hypothesis) and no students scored a 3 or higher in the other rubric dimensions (Figure 2).

Based on this assessment, we can conclude that our students are performing at a relatively low level in critical thinking skills and that students perform better in terms of providing evidence for their position and in drawing conclusions than they do in developing a strong student position. These results sparked an important (albeit informal) discussion among the faculty that participated in the assessment. While there was agreement that the rubric was an effective tool to measure critical thinking, there was some concern that the assignment that was used was too difficult for students and therefore the assessment was not truly representative of student's critical thinking abilities. This will be an ongoing discussion among the members of the assessment committee and the faculty teaching Bio 188 over the summer and for the Fall 2015 semester. These results also brought up an important discussion about course content at different levels of the curriculum. Faculty teaching in both introductory and intermediate level courses began talking about what might need to change in these courses in order to improve student performance. These discussions will be continued in a department-wide discussion during the Fall 2015 faculty retreat.

In addition to using this tool to measure student performance in critical thinking, students in Bio 1, Bio 2 (introductory courses) and Bio 100 (intermediate-level course) have taken the Critical thinking Assessment Test (CAT; https://www.tntech.edu/cat) as part of the NSF-funded SIRIUS project in the Department. The CAT will also be administered to students in Bio 188 during Fall 2015. This project will incorporate authentic research experiences that are threaded into 12 courses throughout the Biological Sciences curriculum. We hypothesize that these experiences will be important in the improvement of critical thinking skills among our students. The CAT data collected now will provide baseline data to which we

can compare student performance after the incorporation of these projects into our curriculum. We will also consider the CAT data, particularly for Bio 188 as an independent assessment of critical thinking as part of next year's annual assessment report.

Table 1. Mean student score for all three rubric dimensions.

Term	Student Position (Hypothesis)	Evidence	Conclusion
Spring 2014 (n=15)	1.54	1.84	1.60
Fall 2014 (n=15)	1.35	1.45	1.48
Combined (n=30)	1.44	1.64	1.54

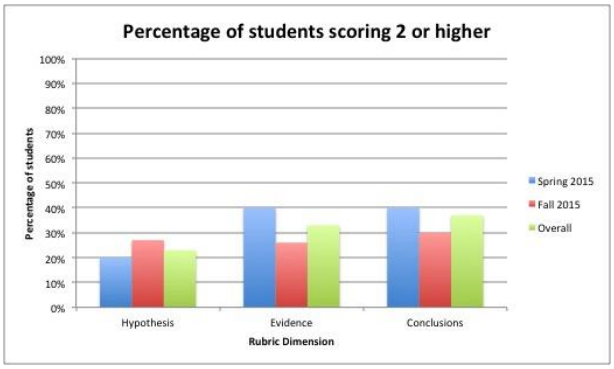


Figure 1. Percentage of students scoring 2 or higher on all three rubric dimensions; data

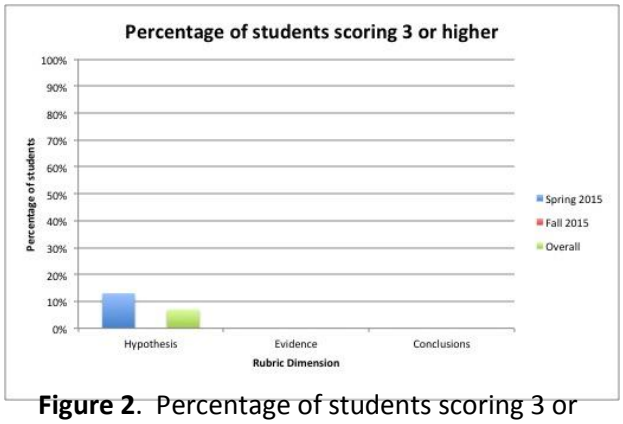


Figure 2. Percentage of students scoring 3 or higher on all three rubric dimensions; data

Q4.2. Are students doing well and meeting program standard? If not, how will the program work to improve student performance of the selected PLO?

The Departmental Assessment Committee from the 2013-14 academic year decided that establishment of a program standard was premature as this assessment represents a brand new assignment in Bio 188 and this represents a drastic change to the previous assessments that the department conducted. The faculty and staff that were involved in the evaluation of student work were disappointed by the overall poor performance by our students at this level. As mentioned in Q4.1 above, there is some concern that this may be because the assignment was too difficult for students to effectively demonstrate their critical thinking abilities. As part of this assignment, students were asked to develop a novel hypothesis and provide evidence for this. This type of assignment requires a great deal of reading from the primary literature and this is an important consideration. This may be too much to ask of undergraduate students. There will be an ongoing discussion as to whether this assignment needs to be modified to a level that is more appropriate for the student population.

This year is the first time that there has been more than two or three faculty involved in examining student work as part of our annual assessment. Because approximately 50% of full-time faculty were involved, this started a very important discussion about the effectiveness of our curriculum. Our department completed a major curriculum revision five years ago. This assessment is the first comprehensive assessment that we have used to address whether we are meeting the core competencies that were established as learning outcomes in our program. The informal discussion that faculty had while scoring student work has started the discussion of where we are addressing these skills within the curriculum. We will discuss these results with the full-time faculty during the Fall 2015 retreat to consider what changes we might need to make to courses to improve student performance.

Q4.3. For **selected** PLO, the student performance:

- [ ] 1. **Exceeded** expectation/standard
- [ ] 2. **Met** expectation/standard
- [ ] 3. **Partially** met expectation/standard
- [ ] 4. **Partially** met expectation/standard
- [X] 5. No expectation or standard has been specified
- [ ] 6. Don't know

Question 5: Use of Assessment Data (Closing the Loop)

Q5.1. As a result of the **assessment effort in 2014-2015** and based on the prior feedback from OAPA, do you anticipate making any changes for your program (e.g., course structure, course content, or modification of PLOs)?

- [X] 1. Yes
- [ ] 2. No (Go to **Q6**)
- [ ] 3. Don't know (Go to **Q6**)

Q5.1.2. Do you have a plan to assess the impact of the changes that you anticipate making?

- [X] 1. Yes
- [ ] 2. No
- [ ] 3. Don't know

Q5.1.1. Please describe what changes you plan to make in your program as a result of your assessment of this PLO. Include a description of how you plan to assess the impact of these changes. **[Word limit: 300 words]**

As a first step, we will discuss the outcomes of the 2014-15 assessment with the faculty during the Fall 2015 retreat. At this time, we hope to consider what changes need to be made to existing courses in order to better prepare students to meet critical thinking standards. These results come at a pivotal time for our department as there is an NSF-funded project that will be taking effect in Fall 2015 to incorporate authentic research experiences into 12 courses within the curriculum. We anticipate that this will have a major impact on student performance, particularly with regard to critical thinking. These two simultaneous activities will result in a number of important changes to the courses in our department that we hope will improve critical thinking in our students. The current draft of our assessment plan will result in an additional assessment of critical thinking using a similar plan in five years. This will allow time for research experiences to be incorporated into courses as well as any other necessary changes to take place.

Q5.2. How have the assessment data from last year (**2013 - 2014**) been used so far? **[Check all that apply]**

	(1) Very Much	**(2)** Quite a Bit	**(3)** Some	**(4)** Not at all	**(8)** N/A
1. Improving specific courses				**X**	
2. Modifying curriculum				**X**	
3. Improving advising and mentoring				**X**	
4. Revising learning outcomes/goals			**X**		
5. Revising rubrics and/or expectations	**X**				
6. Developing/updating assessment plan	**X**				
7. Annual assessment reports	**X**				
8. Program review			**X**		
9. Prospective student and family information				**X**	
10. Alumni communication				**X**	
11. WASC accreditation (regional accreditation)			**X**		
12. Program accreditation				**X**	
13. External accountability reporting requirement				**X**	
14. Trustee/Governing Board deliberations				**X**	
15. Strategic planning			**X**		
16. Institutional benchmarking				**X**	
17. Academic policy development or modification				**X**	
18. Institutional Improvement			**X**		
19. Resource allocation and budgeting				**X**	
20. New faculty hiring				**X**	
21. Professional development for faculty and staff				**X**	
22. Recruitment of new students				**X**	
23. Other Specify:					

Q5.2.1. Please provide a detailed example of how you used the assessment data above.

The assessment activities from 2013-14 involved the development of a revised set of learning outcomes for the Department as well as a preliminary modification of the VALUE rubric for critical thinking. This was also the first attempt that the department made to administer a key assignment in Bio 188. Because of time limitations, student work was not evaluated by departmental faculty other than course instructors for the 2013-14 report. These data provided important feedback on the assignment structure as well as necessary feedback for the modification of the rubric. These activities will continue over the next several years to ensure that we are using an appropriate and effective tool to assess student learning.

Additional Assessment Activities

Q6. Many academic units have collected assessment data on aspects of a program that are not related to PLOs (i.e., impacts of an advising center, etc.). **If** your program/academic unit has collected data on the program elements, please briefly report your results here. **[Word limit: 300]**

N/A

Q7. What PLO(s) do you plan to assess next year?

X	1. Critical thinking
X	2. Information literacy
	3. Written communication
	4. Oral communication
	5. Quantitative literacy
	6. Inquiry and analysis
	7. Creative thinking
	8. Reading
	9. Team work
	10. Problem solving
	11. Civic knowledge and engagement
	12. Intercultural knowledge and competency
	13. Ethical reasoning
	14. Foundations and skills for lifelong learning
	15. Global learning
	16. Integrative and applied learning
	17. Overall competencies for GE Knowledge
	18. Overall competencies in the major/discipline
	19. Other, specify any PLOs that were assessed in 2014-2015 but not included above: a. b. c.

Q8. Have you attached any appendices? If yes, please list them all here:

Appendix 1: Paper prompt for the key assignment used in the assessment
Appendix 2: Modified VALUE rubric used for evaluation

Program Information

P1. Program/Concentration Name(s):
BA/BS in Biological Sciences

P1.1. Report Authors:
Shannon Datwyler

P2. Program Director:
N/A

P2.1. Department Chair:
Ruth Ballard

P3. Academic unit: Department, Program, or College:
Biological Sciences

P4. College:
Natural Sciences and Mathematics

P5. Fall 2014 enrollment for Academic unit *(See Department Fact Book 2014 by the Office of Institutional Research for fall 2014 enrollment:*

The most recent data in the fact book is for Fall 2013; these are the numbers reported for Fall 2013
802 Majors; 688 pre-majors

P6. Program Type: **[Select only one]**

X	1. Undergraduate baccalaureate major
	2. Credential
	3. Master's degree
	4. Doctorate (Ph.D./Ed.d)
	5. Other. Please specify:

Undergraduate Degree Program(s): **P7.** Number of undergraduate degree programs the academic unit has: 2 **P7.1.** List all the name(s): BA in Biological Sciences BS in Biological Sciences **P7.2.** How many concentrations appear on the diploma for this undergraduate program? ***For the BA in Biological Sciences, there is one; For the BS in Biological Sciences, there are 7 concentrations***	***Master Degree Program(s):*** **P8.** Number of Master's degree programs the academic unit has: 2 **P8.1.** List all the name(s): MA in Biological Sciences MS in Biological Sciences **P8.2.** How many concentrations appear on the diploma for this master program? Five
Credential Program(s): **P9.** Number of credential programs the academic unit has: N/A **P9.1.** List all the names:	***Doctorate Program(s)*** **P10.** Number of doctorate degree programs the academic unit has: N/A **P10.1.** List all the name(s):

When was your assessment plan?	1. Before 2007-08	2. 2007-08	3. 2008-09	4. 2009-10	5. 2010-11	6. 2011-12	7. 2012-13	8. 2013-14	9. 2014-15	10. No formal plan
P11. Developed										X
P12. Last updated										X

	1. Yes	2. No	3. Don't Know
P13. Have you developed a curriculum map for this program?	X		
P14. Has the program indicated explicitly where the assessment **of student learning** occurs in the curriculum?	X		
P15. Does the program have any capstone class?	X		
P16. Does the program have **ANY** capstone project?	X		

Assessing Other Program Learning Outcomes (Optional)

If your program assessed PLOs not reported above, please summarize your assessment activities in the table below. If you completed part of the assessment process, but not the full process (for example, you revised a PLO and developed a new rubric for measuring it), then put N/A in any boxes that do not apply.

Report Assessment Activities on Additional PLOs Here

Q1: Program Learning Outcome (PLO)	Q2: Standard of Performance/ Target Expectation	Q3: Methods/ Measures (Assignments)	Q4: Data/Findings/ Conclusions	Q5: Use of Assessment Data/ Closing the Loop

Example: Educational Technology (iMet), MA

Q1: Program Learning Outcome (PLO)	Q2: Standard of Performance/ Target Expectation	Q3: Methods/ Measures (Assignments)	Q4: Data/Findings/ Conclusions	Q5: Use of Assessment Data/ Closing the Loop
<u>Critical Thinking Skills</u> 6.1 Explanation of issues 6.2 Evidence 6.3 Influence of context and assumptions 6.4 Student's position 6.5 Conclusions and related outcomes (See Critical Thinking Rubric and data tables on Next Page)	Seventy percent (70 %) of our students will score 3.0 or above in all five dimensions using the VALUE rubric by the time they graduate from the four semester program.	Culminating Experience Projects: Master's Thesis	Students meet the standards of 6.1 (92%), 6.4 (77%) and 6.5 (69%). Students do not meet the standards of 6.2 (61%) and 6.3 (61%). **Students meet some of our Critical Thinking standards.** <u>The areas needing improvement</u>: 1). 6.2: Evidence (61%) 2). 6.3: Influence of context and assumptions (61%).	In order to help students in our program successfully become critical thinking researchers, we will design more classroom activities and assignments related to: 1). Re-examination of evidence (6.2) and context and assumptions (6.3) in the research 2). Require students to apply these skills as they compose comprehensive responses for all

Example: Chemistry BS/BA

Students will quantitatively determine the composition of chemical unknowns through the use of classical and modern analytical techniques and instrumentation.	Target performance for this assessment was that 50% of students would demonstrate "mastery" (i.e., reported values within 0.5% of the true value) and 75% of students would demonstrate "proficiency" (i.e., reported values within 1.0% of the true value).	Students were provided with nine chemical samples and quantitatively analyzed each unknown to determine their respective weight percent of chloride in a solid.	Findings were 44% mastery and 56% proficiency.	To close the loop, faculty has implemented additional opportunities for practice and achievement in analytical techniques and methodology in two core courses.

Additional PLOs

PLO				
PLO				
PLO				

Attachment I: The Development of Program Learning Outcomes

The Importance of Verbs

Multiple Interpretations:	**Fewer Interpretations:**
to grasp	to write
to know	to recite
to enjoy	to identify
to believe	to construct
to appreciate	to solve
to understand	to compare

Relevant Verbs in Defining Learning Outcomes

(Based on Bloom's Taxonomy)

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
Cite	Arrange	Apply	Analyze	Arrange	Appraise
Define	Classify	Change	Appraise	Assemble	Assess
Describe	Convert	Compute	Break Down	Categorize	Choose
Identify	Describe	Construct	Calculate	Collect	Compare
Indicate	Defend	Demonstrate	Categorize	Combine	Conclude
Know	Diagram	Discover	Compare	Compile	Contrast
Label	Discuss	Dramatize	Contrast	Compose	Criticize
List	Distinguish	Employ	Criticize	Construct	Decide
Match	Estimate	Illustrate	Debate	Create	Discriminate
Memorize	Explain	Interpret	Determine	Design	Estimate
Name	Extend	Investigate	Diagram	Devise	Evaluate
Outline	Generalize	Manipulate	Differentiate	Explain	Explain
Recall	Give Examples	Modify	Discriminate	Formulate	Grade
Recognize	Infer	Operate	Distinguish	Generate	Interpret
Record	Locate	Organize	Examine	Manage	Judge
Relate	Outline	Practice	Experiment	Modify	Justify
Repeat	Paraphrase	Predict	Identify	Organizer	Measure
Reproduce	Predict	Prepare	Illustrate	Perform	Rate
Select	Report	Produce	Infer	Plan	Relate
State	Restate	Schedule	Inspect	Prepare	Revise
Underline	Review	Shop	Inventory	Produce	Score
	Suggest	Sketch	Outline	Propose	Select
	Summarize	Solve	Question	Rearrange	Summarize
	Translate	Translate	Relate	Reconstruct	Support
		Use	Select	Relate	Value
			Solve	Reorganize	
			Test	Revise	

Attachment II: Simplified Annual Assessment Report

Basic Assessment

Q1. Program Learning Outcome	**Q2.** Standards of Performance/Target Expectations	**Q3.** Methods/ Measures (Assignments) and Surveys	**Q4.** Data/Findings/ Conclusion	**Q5.** Use of Assessment Data/ Closing the Loop

Examples:

Chemistry, BS/BA

(Example of Content Knowledge)

PLO 1: Students will quantitatively determine the composition of chemical unknowns through the use of classical and modern analytical techniques and instrumentation.	Target performance for this assessment was that 50% of students would demonstrate "mastery" (i.e., reported values within 0.5% of the true value) and 75% of students would demonstrate "proficiency" (i.e., reported values within 1.0% of the true value).	Students were provided with nine chemical samples and quantitatively analyzed each unknown to determine their respective weight percent of chloride in a solid.	Findings were 44% mastery and 56% proficiency.	To close the loop, faculty has implemented additional opportunities for practice and achievement in analytical techniques and methodology in two core courses.

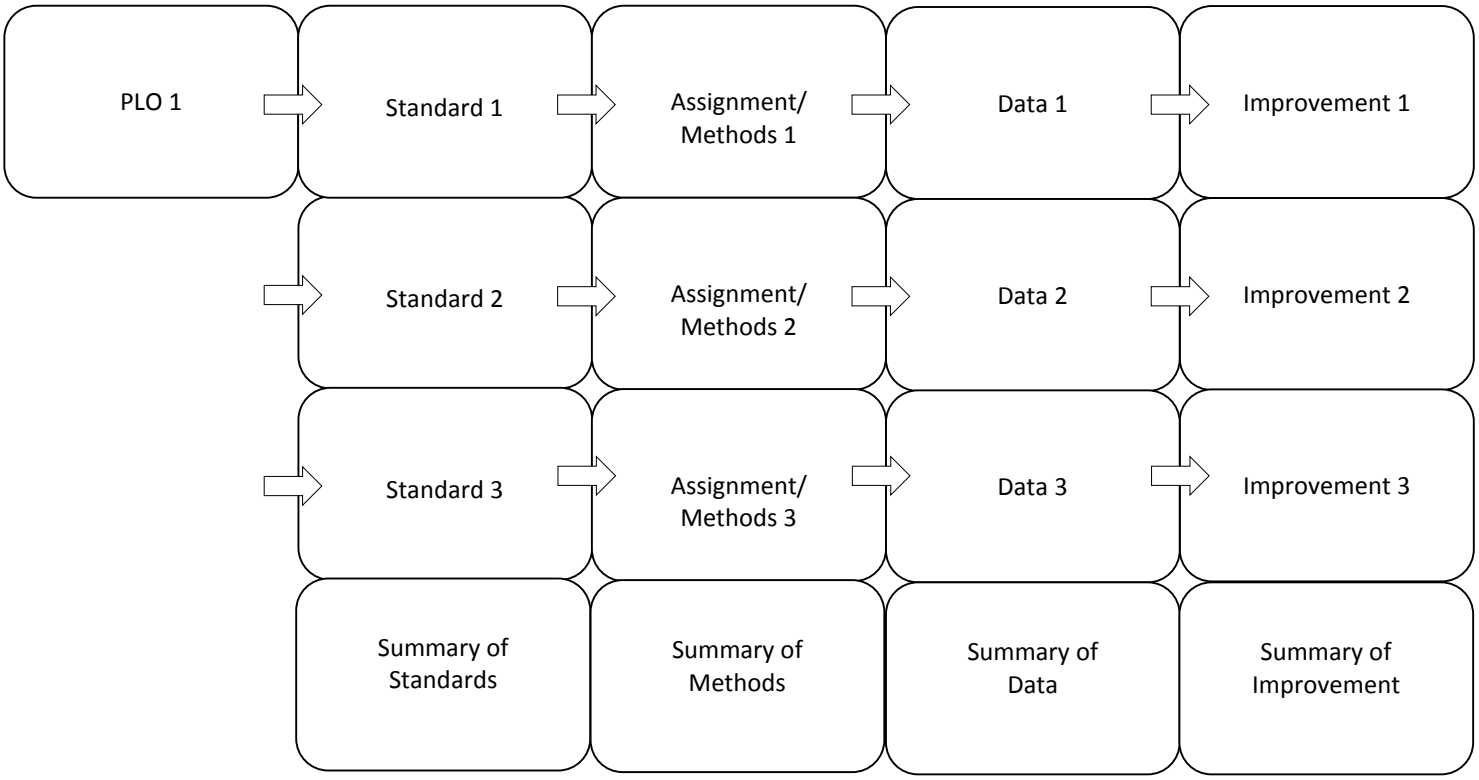
Educational Technology (iMet), MA

(Example of Complicated Skills)

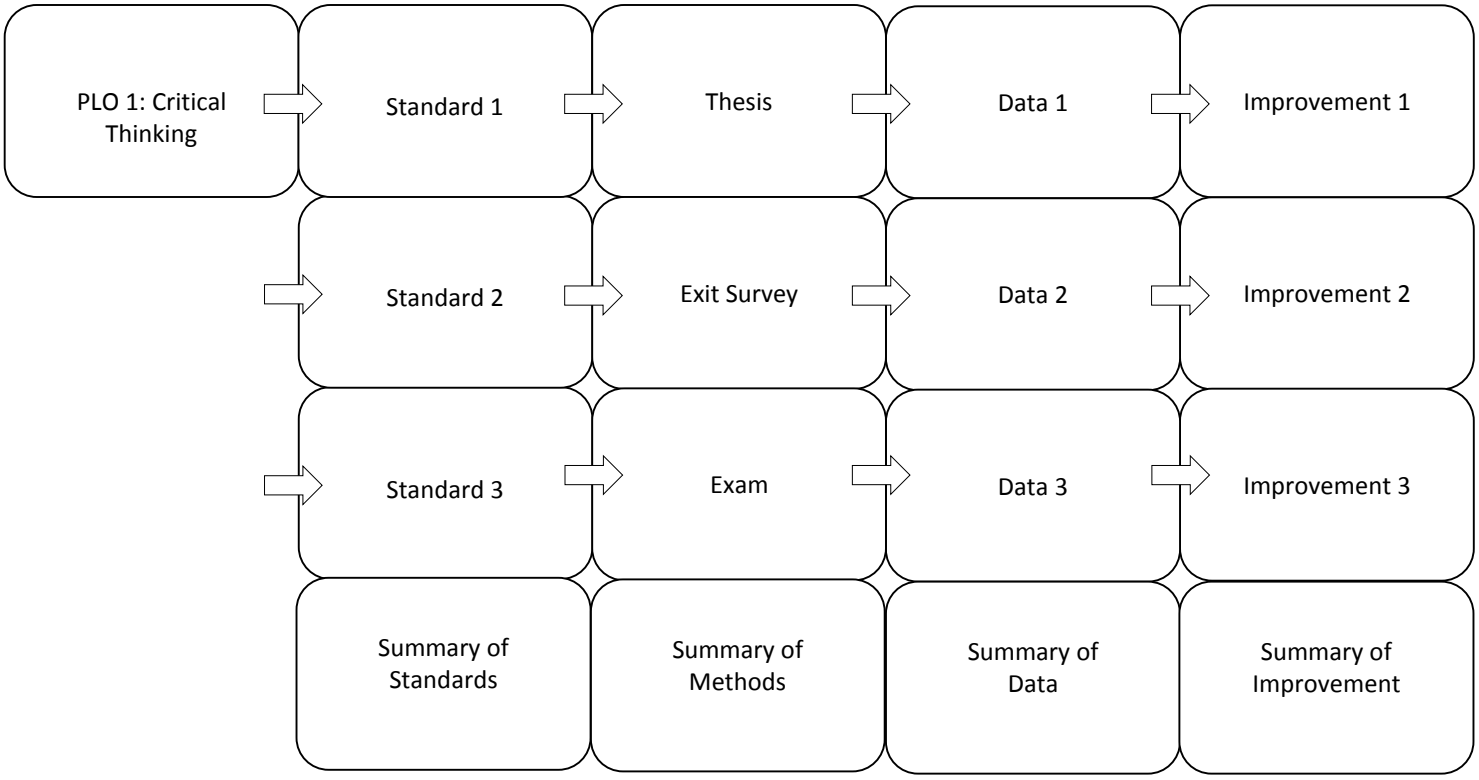
PLO 1: <u>Critical Thinking Skills</u> **6.1** Explanation of issues **6.2** Evidence **6.3** Influence of context and assumptions **6.4** Student's position **6.5** Conclusions and related outcomes (See Appendix III)	Seventy percent (70 %) of our students will score 3.0 or above in all five dimensions using the VALUE rubric by the time they graduate from the four semester program.	Culminating Experience Projects: Master's Thesis	Students *meet* the standards 6.1 (92%), 6.4 (77%) and 6.5 (69%). Students *do not* meet the standards 6.2 (61%) and 6.3 (61%). **Students meet some of our Critical Thinking standards.** <u>The areas needing improvement</u>: 1). 6.2: Evidence (61%) 2). 6.3: Influence of context and assumptions (61%).	In order to help students in our program successfully become critical thinking researchers, we will design more classroom activities and assignments related to: 1). Re-examination of evidence (6.2) and context and assumptions (6.3) in the research 2). Require students to apply these skills as they compose comprehensive responses for all

Assessment Flowchart – Multiple Methods

One PLO Assessed by Multiple Assignments

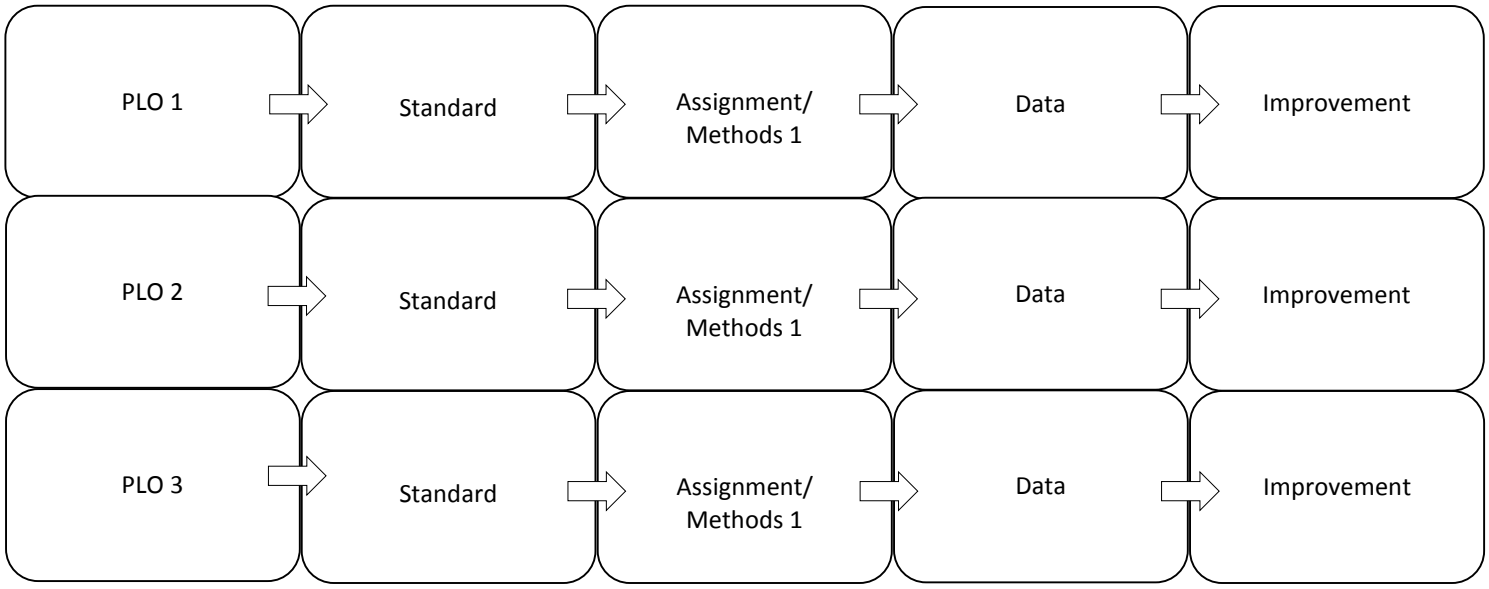


Multiple-Methods Example:

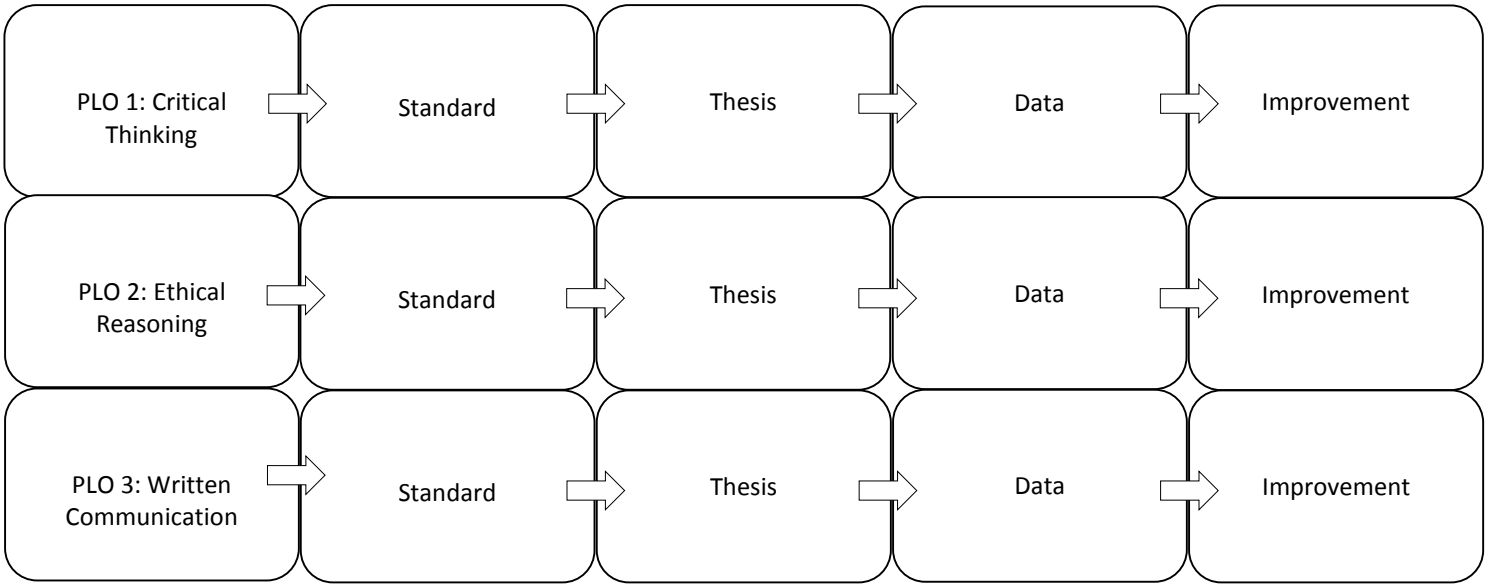


Assessment Flowchart – Multiple PLOs

Multiple PLOs Assessed by One Assignment



Multiple-PLOs Example



Attachment III: Program Learning Outcomes (PLOs) for the Educational Technology (iMet) Graduate Program

Table I: The Results for Critical Thinking Skill

Note: Data shown here drawn from Data Collection Sheet[1]

Different Levels[2] / Five Criteria (Areas)[2]	Capstone (4)	Milestone (3)	Milestone (2)	Benchmark (1)	Total (N=10)
6.1: Explanation of issues	38%	54%	0%	8%	(100%, N=13)
6.2: Evidence	15%	46%	23%	15%	(100%, N=13)
6.3: Influence of context and assumptions	15%	46%	23%	15%	(100%, N=13)
6.4: Student's position	23%	54%	8%	15%	(100%, N=13)
6.5: Conclusions and related outcomes	15%	54%	15%	15%	(100%, N=13)

Standards of Performance for Education Technology (iMet) Graduate Students

Q2.3. If your program has an explicit standard(s) of performance for the selected PLO, describe the desired level of learning: *Seventy percent (70 %) of our students will score 3.0 or above using the VALUE rubric by the time they graduate from the four semester program.*

[1]Critical Thinking Data Collection Sheet

Different Levels[2] / Five Criteria (Areas) [2]	(4)	(3)	(2)	(1)	Total (N=10)
6.1: Explanation of issues	5	7	0	1	(N=13)
6.2: Evidence	2	6	3	2	(N=13)
6.3: Influence of context and assumptions	2	6	3	2	(N=13)
6.4: Student's position	3	7	1	2	(N=13)
6.5: Conclusions and related outcomes	2	7	2	2	(N=13)

[2]Critical Thinking Value Rubric

Criterion	Capstone 4	Milestone 3	Milestone 2	Benchmark 1
6.1: Explanation of issues	Issue/problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.	Issue/problem to be considered critically is stated without clarification or description.
6.2: Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis.	Information is taken from source(s) with enough interpretation/evaluation to develop a coherent analysis or synthesis.	Information is taken from source(s) with some interpretation/evaluation, but not enough to develop a coherent analysis or synthesis.	Information is taken from source(s) without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question.
6.3: Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions).
6.4: Student's position (perspective, thesis/ hypothesis)	Specific position (perspective, thesis/hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Others' points of view are synthesized within position.	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/hypothesis) is stated, but is simplistic and obvious.
6.5: Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect students' informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Appendix I: Critical Thinking Value Rubric for PLO 6: Critical Thinking Skill (Rubric to Assess Master Thesis and ePortfolio)

Criterion	Capstone 4	Milestone 3	Milestone 2	Benchmark 1
6.1: Explanation of issues	Issue/problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.	Issue/problem to be considered critically is stated without clarification or description.
6.2: Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis.	Information is taken from source(s) with enough interpretation/evaluation to develop a coherent analysis or synthesis.	Information is taken from source(s) with some interpretation/evaluation, but not enough to develop a coherent analysis or synthesis.	Information is taken from source(s) without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question.
6.3: Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions).
6.4: Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Others' points of view are synthesized within position.	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/hypothesis) is stated, but is simplistic and obvious.
6.5: Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Standards and Achievement Targets: 70 % of our first year graduate students should score **3 or above** by the time of their graduation.

Appendix II: Key Assessment for the iMET Program
Culminating Experience Report

Culminating Experience Report (Action Research Report): The main task in action research is to design and implement a study using data collection tools that will allow you to "show" the reader what happened during and as a result of your intervention. After collecting your data, you will sort through your findings, looking for bits of data that reveal some information pertinent to your study. You then look for relationships (patterns) between these bits or pieces. The patterns that emerge from a variety of sources such as things that happen, things that you observe, things that people say and things that you measure result in your findings (conclusions).

Suggested Headings for iMET Action Research Report

Title Page
Abstract
Introduction

Statement Of The Problem
Significance
Research Questions
Definitions

Review of Literature
Methods

Description of the Innovation/Intervention
Setting
Limitations/Delimitations of the Study
Data Collection
- **Types of data collected.**
- **Subjects.**
- **Variables.**
- **Steps taken.**

Data Analysis
- **Procedures.**
- **Validity and reliability.**

Findings
Discussion
References
Appendices

Appendix III: Key Assessment for the iMET Program
ePortfolio

The iMET culminating experience is an ePortfolio consisting of:

1. **Abstract**: Simply put, the portfolio abstract is an introduction to your e-portfolio. The basic components of the abstract includes elements such as:
   - a welcome to the reader
   - an overview of the portfolio components
   - an introduction to the navigation of the portfolio
2. **Process**: The process section of the portfolio consists of a personal reflection on your experience of the iMET program and a resume. In addition, many students include a narrative of their teaching history and philosophy in this section.
3. **Products:** In the product section of the portfolio, you link artifacts (products) you have created during your time in the program. Each product you include in the product section must be accompanied by:
   - a description of how the product was conceived (what was the individual or group process that led to the creation of the product).
   - a description of how technology and teaching strategies were utilized
   - standards covered by the use of the product
   - feedback on the product you have received from received 2 peers and 1 faculty on your project
   - Most portfolio's contain at least 3-5 Artifacts
4. **Report: Literature Review and Action Research**

Literature Review: The goal of the literature review is to introduce your readers to your research by synthesizing for them what has been written about your area of focus. It is also a place where you address the educational theories that motivated the design of your research. Ultimately, the review of literature should set the stage for your discussion of your research. Also remember that, though you can use a variety of sources, it is very important to share primary sources of information.

Action Research: The main task in action research is to design and implement a study using data collection tools that will allow you to "show" the reader what happened during and as a result of your intervention. After collecting your data, you will sort through your findings, looking for bits of data that reveal some information pertinent to your study. You then look for relationships (patterns) between these bits or pieces. The patterns that emerge from a variety of sources such as things that happen, things that you observe, things that people say and things that you measure result in your findings (conclusions).

5. **Symposium: Electronic Poster and/or Webinar**