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SOUTHWESTERN

AN OREGON COMMUNITY COLLEGE

NWCCU 2020 Comprehensive Report

Addenda Exhibits

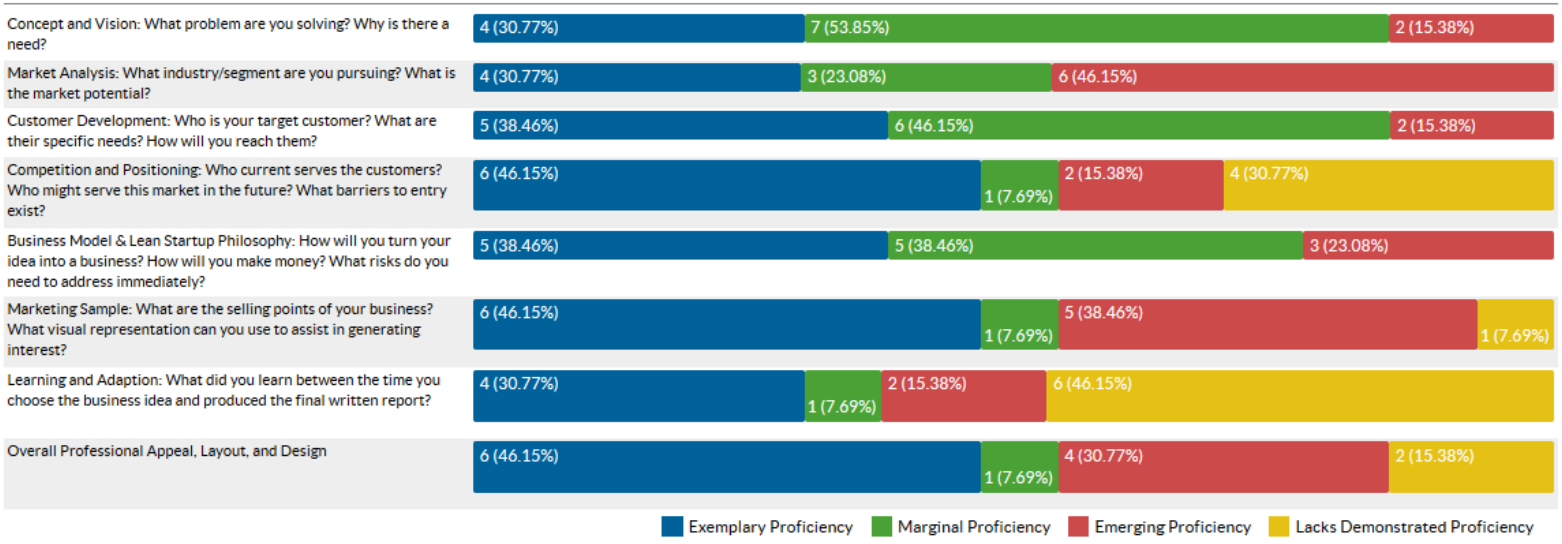
APPENDIX G

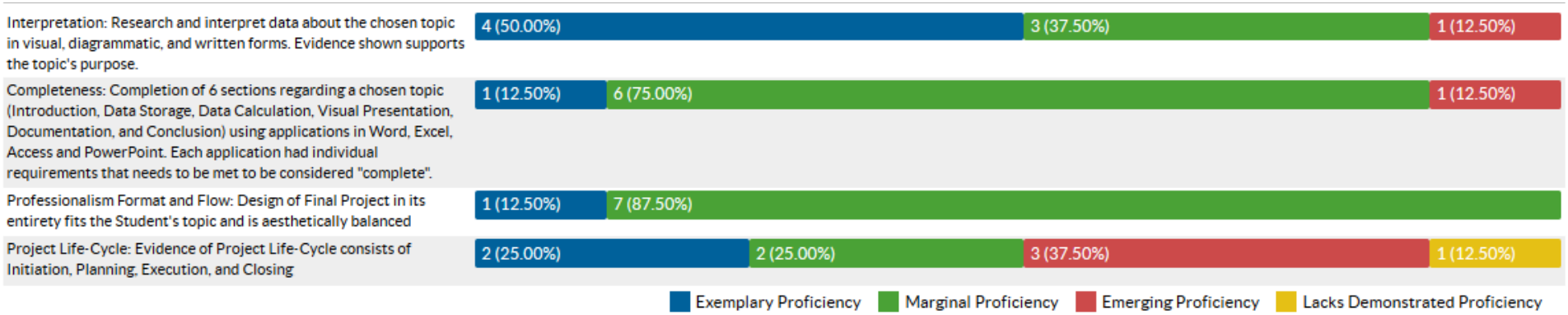
Sample Outcomes Assessments

Computer Information Systems

Program Outcome 5	Measureable Criteria	Measurement Tool	Courses	Time Frame
Apply project-life-cycle concepts to assist in business need solutions.	Overall Proficiency @ 50%	Rubric for assessing final project. Learning and Adaption (CIS 250) and Project Life-Cycle evidence (CIS 120)	CIS 250 CIS 120	Fall 2017-2018 Term

Results:





Analysis:

- ✓ I do not think the measurement tool did a fair job at measuring the level of outcome for CIS 250.
- ✓ Did a fair job at measuring outcome for CIS 120. I was able to use this outcome in previous terms. Though planning, I added it to the grading rubrics and instructions.

Plan: (KEY Step in outcomes assessment process)

- ✓ CIS 250 –
  - o Used rubric for assessment, but did not include it as a grading rubric for the final assignment. Making the rubric available to students will give the students a better idea of expectations regarding professionalism and layout.
  - o This was the first time I had taught this course. The coursework resulted in two exceptional examples to show to future students.
- ✓ CIS 120 –
  - o This was an improvement from previous term's course assessment. Added the outcome of Life Cycle Improvement to the grading and assessment rubric and gave example of using instructor feedback to aid in making enhancements to previously submitted assignments before turning the project in for the final.
  - o Will take extra time to stress the importance on continual improvement going forward.

Psychology

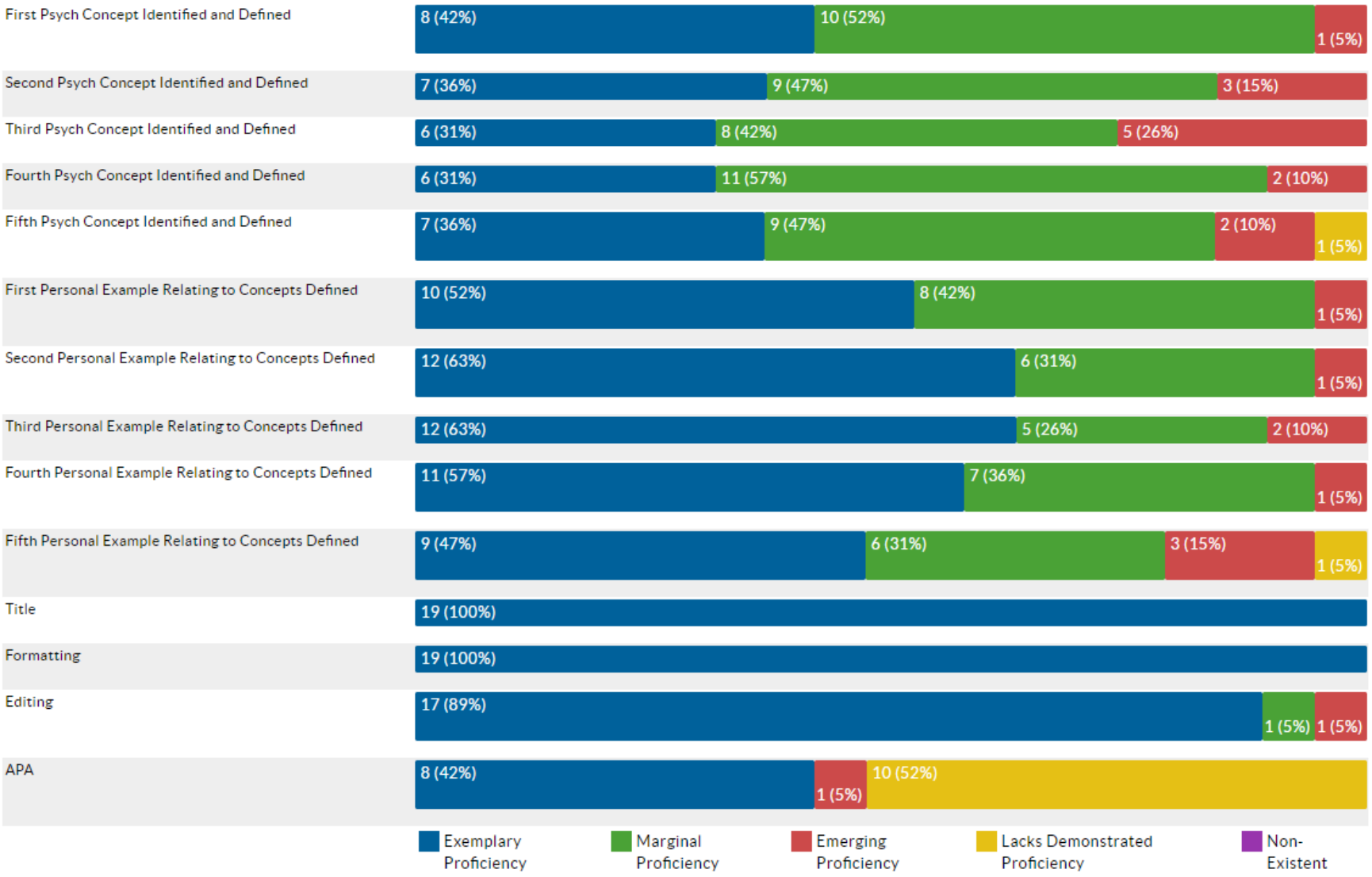
Outcome 1	Measurable Criteria	Measurement Tool	Courses	Time Frame
Demonstrate knowledge of the theoretical and conceptual frameworks of a particular Social Science discipline.	80% of the class will earn a C or better on the research project/essay following the scoring rubric for essay questions.	Major Writing Assignment: Applying Psychology to Real Life	Douda PSY203	Spring 2017

Results: Figures on following page

Analysis:
Overall, the average grade on this assignment was a 40.9/50, or an 81.8%. The biggest area for student improvement is their use and application of APA style in-text citations, where 52% of student assignments lacked demonstrated proficiency. This is an improvement over the assignment from the previous course/term (PSY202, Winter 2017), where 63% of students lacked demonstrated proficiency on their in-text citations. It is also apparent that students are better at coming up with examples to fit with certain concepts in psychology than they are at sufficiently defining those concepts.

Plan:
Students clearly grasped the critical thinking content of this assignment, but could use improvement in clearly defining psychological concepts in a way that an audience not familiar with psychology could understand. Students' use and proper application of APA in-text citations are still below expectations. In future classes using this assignment, I will spend more in-class time, in the form of low-stakes writing assignments and a group activity, demonstrating the importance of giving credit to the work of others (e.g., in-text citations). In addition, more time will also be spent helping the students understand the importance of writing clearly so that individuals who don't share their same knowledge-base can understand their ideas fully.

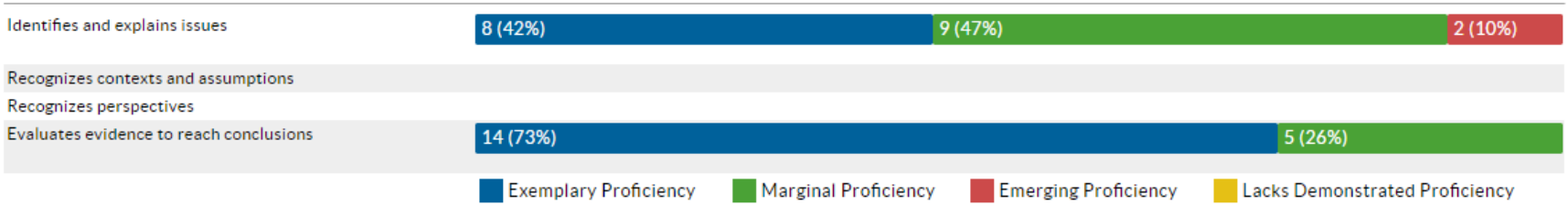
Major Writing Assignment:



Major Writing Assignment, GSLO Rubric:

Rubric View: 4GSLO CCAT Creative, Critical & Analytical Thinking

	Exemplary Proficiency (4 pts)	Marginal Proficiency (3 pts)	Emerging Proficiency (2 pts)	Lacks Demonstrated Proficiency (1 pts)	*Mean*	*Mode*	*Stdev*
Identifies and explains issues	8	9	2	0	3.316	3.000	0.653
Recognizes contexts and assumptions	0	0	0	0	0.000	NA	0.000
Recognizes perspectives	0	0	0	0	0.000	NA	0.000
Evaluates evidence to reach conclusions	14	5	0	0	3.737	4.000	0.440

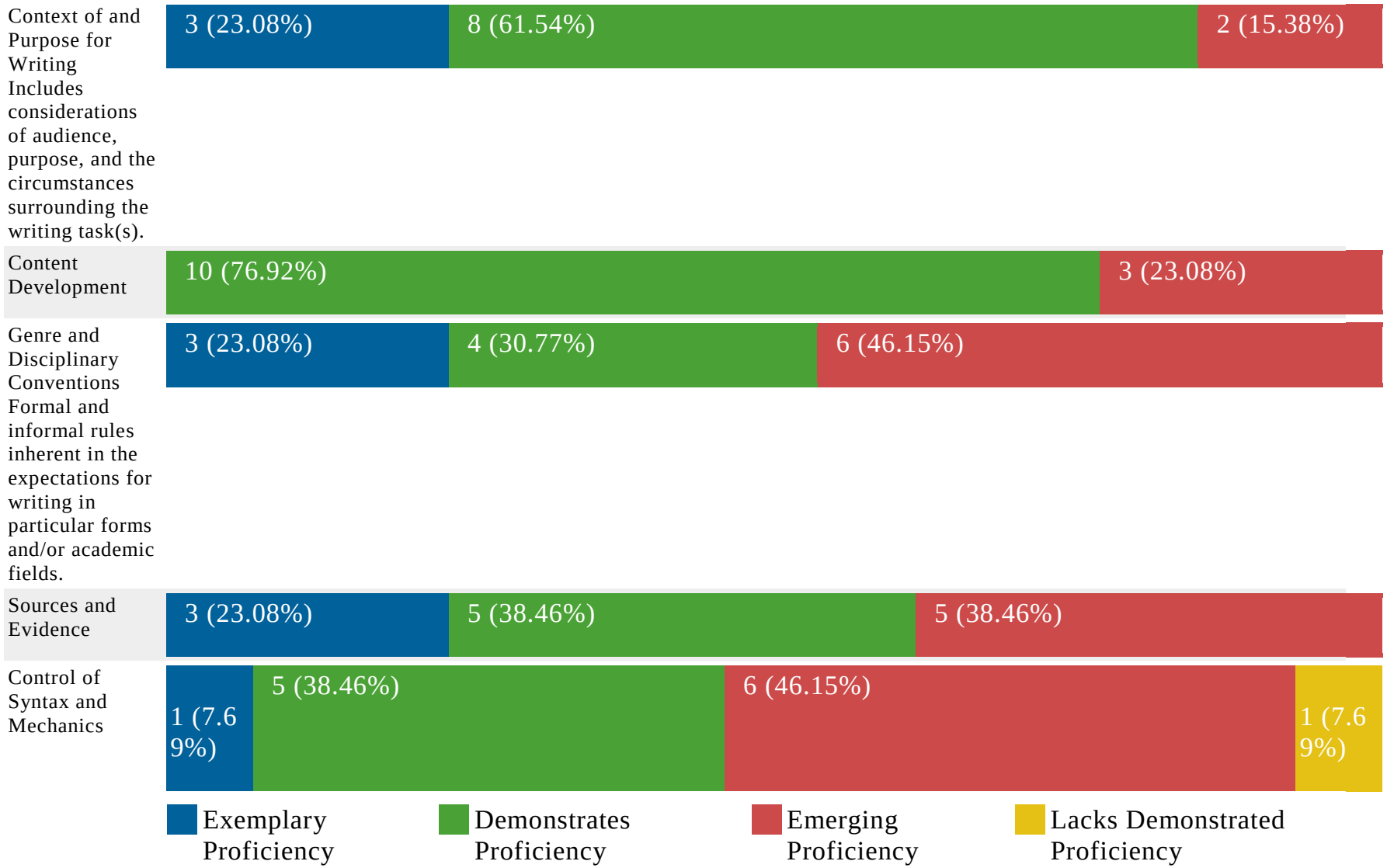


Writing

Outcome 2	Measureable Criteria	Measurement Tool	Courses	Time Frame
Demonstrate consistent use of conventions particular to a specific writing task including organization, content, presentation, and stylistic choices.	70% of students have achieves "demonstrates proficiency" or higher on context and purpose, content development, genre conventions, sources and evidence, and control of syntax and mechanics.	Final research essay	WR 123	Spring 2017

Rubric View:

	Exemplary Proficiency (4 pts)	Demonstrates Proficiency (3 pts)	Emerging Proficiency (2 pts)	Lacks Demonstrated Proficiency (1 pts)	*Mean*	*Mode*	*Stdev*
Context of and Purpose for Writing Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).	3	8	2	0	3.077	3.000	0.615
Content Development	0	10	3	0	2.769	3.000	0.421
Genre and Disciplinary Conventions Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields.	3	4	6	0	2.769	2.000	0.799
Sources and Evidence	3	5	5	0	2.846	2.000	0.769
Control of Syntax and Mechanics	1	5	6	1	2.462	2.000	0.746


Context of and Purpose for Writing Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).
3 (23.08%)
8 (61.54%)
2 (15.38%)
Content Development
10 (76.92%)
3 (23.08%)
Genre and Disciplinary Conventions Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields.
3 (23.08%)
4 (30.77%)
6 (46.15%)
Sources and Evidence
3 (23.08%)
5 (38.46%)
5 (38.46%)
Control of Syntax and Mechanics
1 (7.69%)
5 (38.46%)
6 (46.15%)
1 (7.69%)
Exemplary Proficiency
Demonstrates Proficiency
Emerging Proficiency
Lacks Demonstrated Proficiency

Results: Less than a third of the class demonstrated exemplary proficiency in recognizing the effectiveness and purpose of **sources and evidence**. The majority of students took the texts at face value without examining the credibility or agenda of the authors. Because of this, sources with little merit, or that relied on sketchy evidence, were given the same attention as works of greater magnitude in which the authors had incorporated careful and thorough research. 76% of students were successful in their **content development**. Only 23% of students displayed exemplary proficiency in incorporating **genre and disciplinary conventions**. Only 23% of students displayed exemplary proficiency in utilizing **sources and evidence**. Only 1% of students displayed exemplary proficiency in control of **syntax mechanics**. 70% of students have demonstrated proficiency in these areas.

Analysis: An inability to determine the efficacy of a source, I feel, stems from haphazard planning and poor time management on the part of students. I think a clear solution to this problem is to have students present their sources before the entire class and to ask their colleagues important questions about the veracity and design of the sources. I have found that often students not involved with research for the specific topic are able to better identify a compelling and accurate source than the student who has chosen the topic. This inability on the part of students to identify a worthwhile source comes from poor time management and source overload. I find it important to remind them that a large number of sources does not always insure accurate or compelling information. A careful examination and open discussion of source material in the classroom helps eliminate the use of less than effective sources. 70% of students will have demonstrated proficiency in these areas.

Plan:

- **In regards to context and purpose, my aim is to enhance student's understanding and utilization of these two concepts by making students more aware of the historical, social, and cultural significance of the material they are discussing. In order to achieve this, students be aware of authors and their backgrounds as well as have an awareness of the era in which a piece was written.**

- **In regards to helping students gain a more comprehensive understanding of genre and disciplinary conventions, I will ask that they recognize different styles and approaches in writing as well as the audiences these styles are intended to address. Once they recognize an effective design in a published piece of writing, I will encourage them to considering modeling their own writing after that particular style.**

- **In regards to having students enhance their interpretation and inclusion of sources and evidence, I intend to have students, in the weeks leading up to the time of writing their essay, present to the class the sources they hope to use for their research essay. During this presentation each student must display a clear understanding of each source's strengths and weaknesses. This presentation must include an examination of the source's own citations. Important**

questions that must be addressed during this discussion are: Does the source reveal examples of thorough research? Is the source's research recorded clearly? And perhaps, most importantly, does the author analyze their sources clearly? The point here is to drive home the idea that these three questions are what readers will be asking of the student's own work. Insubstantial sources, it must be stressed, will only weaken a student's essay. The main point of this exercise will be to establish the idea that careful consideration of sources, as well as a thorough understanding of them, is essential to a successful essay.

- **In regards to control and syntax I see value in having students review each other's work. There is added incentive for students to craft correct and clear sentences when they are sharing work with classmates. I also feel there is less immediate stress for students when working in this environment. Perhaps the most important part of this task is asking the students who are doing doing the reviewing to identify the most consistent errors and for them to find a way to address these issues with the classmate whose work they are commenting on.**

Outcome 1	Measureable Criteria	Measurement Tool	Courses	Time Frame
Be able to use multiple writing strategies in order to explore, clarify, and effectively communicate ideas to appropriate audiences.	80% demonstrating proficiency	Essay Grading Rubric Evaluation of in-class persuasive essay with introduction, outline, and conclusion	WR 122	Winter 2017

Results: (See chart below)

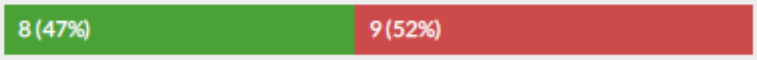
Analysis: 82 % of the students demonstrated audience awareness when writing a persuasive essay, but more should be moving to an exemplary level. It is possible that a summative assignment done in class as a final examination depresses the level of audience awareness the students should be demonstrating. It might be wise to assess a final essay that is written to specific audience profile.

Plan: I might have students do a pre-writing exercise that demonstrates how they would frame the same argument differently for two different audiences. Another idea to is have student engage in more meta-discourse about what steps they had taken to persuade their specific audience.

Rubric View: SWOCCwritten communication rubric

	Exemplary Proficiency (4 pts)	Demonstrates Proficiency (3 pts)	Emerging Proficiency (2 pts)	Lacks Demonstrated Proficiency (1 pts)	*Mean*	*Mode*	*Stdev*
Context of and Purpose for Writing Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).	1	14	2	0	2.941	3.000	0.416
Content Development	0	8	9	0	2.471	2.000	0.499
Genre and Disciplinary Conventions Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields.	1	8	8	0	2.588	2.000	0.600
Sources and Evidence	0	11	6	0	2.647	3.000	0.478
Control of Syntax and Mechanics	0	9	8	0	2.529	3.000	0.499

Context of and Purpose for Writing Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).



Content Development

Genre and Disciplinary Conventions Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields.

Sources and Evidence

Control of Syntax and Mechanics

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Assessment Reporting

OUTCOME ASSESSMENT REPORTS

Outcome

Which outcome is being measured or assessed?

Utilize Social Science approaches, such as research methods, inquiry, or problem solving, to examine the variety of perspectives about human experiences.

GLSO: Critical Thinking
GLSO: Communication

Measure Title

What is being measured within that outcome?

Critically thinking with regard to interpreting and understanding the results of academic literature and its portrayal in popular press and academic journal articles.

Measure Type/Method

Which type of method is used to measure the outcome?

Direct—Student Artifact	Indirect—Survey
Direct—Exam	Indirect—Focus Group
Direct—Portfolio	Indirect—Interview
Direct—Other	Indirect—Other

Measure Level

Which outcome level is being measured?

Course	**Institution (GSLO)**
Program	Other

Indicator (Measurement)

How is the outcome to be measured?

Measured by the percentage of students who demonstrate approaching proficiency or higher by earning a C or better on the research project/essay following the scoring rubric for essay questions on Writing Assignment #3: Evaluating Research for PSY 201.

Thresholds

Which levels determine achievement?

Green - 80% or higher (achieved proficiency)
Yellow - 70%-79% (approaching proficiency)
Red - at or below 69% (lacking proficiency)

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Assessment Reporting

Purpose and Meaning

What is the significance of this indicator?

Students will demonstrate an understanding of self and the world by examining the dynamic interaction of individuals, groups, and societies as they shape and are shaped by history culture, institutions, and ideas. Students getting a C or better have successfully demonstrated their ability to evaluate aspects of research claims.

Key/Responsible Personnel

Who assesses this outcome?

Nathaniel Douda

Summary of Findings

What are the measurement results?

The average grade on this assignment was an 82.2%.

Fall 2018 Performance: Overall, the average grade on this assignment was an 83.3%.

Reflection, Analysis and Data Evidence

What do the results reveal?

Overall, the average grade on this assignment was an 82.2%, which suggests the majority “achieved proficiency”. This assignment meets two of the general student learning outcomes (critical thinking and communication).

Students did an excellent job summarizing the claims they read and coming up with a thesis statement that summarized their argument. Compared the last term (Fall 2018), students performed much better on the section of this assignment that asked them to explain whether the claim was scientifically valid – I attribute this change in performance to the additional worksheet I asked them to complete as an earlier writing assignment in this series of assignments. Students had more difficulty thoroughly explaining all of the criteria they used to make their arguments and struggled with articulating the meaningful differences between the popular press articles rendition of the claim when compared to the academic article. While the mean score for “difference comparison” was the lowest, many students received perfect scores in this section of their papers. The way I implemented a comparison of the two articles could be revised in the next iteration of this assignment.

It would be difficult to make direct comparisons to the assignment from previous terms, as I revised this assignment series and modified it significantly for the current term. I spent more time reflecting on what skills I was asking my students to demonstrate and improve upon with this particular assignment and then stripped out the unnecessary portions that may have been creating barriers to student success on the core skills I needed them to demonstrate. In previous terms, I was asking for a well-written essay with an integration of the methodical evaluation of the

scientific credibility of the claims they were asked to read. For a significant number of students, it was evident that effort they were putting into attempting to craft a well written argument was interfering with their ability to thoroughly critique the application of the scientific method in the claims they read. Many students in my class were lacking in the ability to write an argumentative essay, and the time required to develop those skills was taking away from the focus of the assignment. The revised version of the assignment still involves writing, but I have created a worksheet document where students are asked to discuss each component of their evaluation in a compartmentalized way (e.g., focusing on how biases impacted the research in one section, focusing on how the data was presented and analyzed in another, etc) as opposed to integrating all of these ideas into a cohesive essay.

In comparison to previous terms (FA2016, 2017), students did much better with their APA in-text citations and reference sections, and their performance was on par with FA2018. My approach in the previous two years to help improve their performance on this portion of the paper was to spend less class time talking about it, as it appeared students were becoming overwhelmed with all of the details required for this assignment when discussed in class. Instead, I created walk-through guides for using APA formatting and citations and made them available on MyLakerLink and provided additional examples within the assignment details. These walk-throughs appear to have given students enough assistance, but also required the students to develop some autonomy in figuring out how to complete this portion of the paper.

Plan:

As a whole, students met the measurable criteria for this assignment. Students who followed the directions did very well, while students who deviated from the assignment instructions performed worse than desired. I am working on new ways of getting more students to follow the instructions (which may including talking about the assignment less in class, so they are required to read about it on their own and instead use class-time to address their questions or concerns). This assignment coincides nicely with the learning outcomes of this course and discipline, so I will continue to use this assignment in the future.

Students could improve on the portion of the assignment where they are asked to thoroughly describe the criteria they used to support their evaluations of the claim. Since the previous two years (FA2017, FA2018), I have included more in-class discussion on the ways to evaluate scientific

research and have designated time for the students to work together to complete a miniature version of this assignment. From soliciting student feedback, it appears that many students are underestimating the amount of time it will take them to thoroughly investigate these criteria throughout the claim – I will be sharing this feedback with future students as more evidence why they should start on these assignments earlier (other reasons include: I will give them unlimited feedback and revisions before the official due date, but few students take me up on that offer).

In order to help students become even more successful at this portion of the assignment, I will be adding an additional, intermediary in-class project where students will apply these research methods concepts to a variety of scenarios. I believe that additional practice will help to improve their performance.

Lastly, I will be revising this assignment for the next term. These revisions include changing the assignment series. Writing assignment #1 will be an evaluation criteria worksheet that applies to the popular press version of a research claim. Writing assignment #2 will be an evaluation criteria worksheet that applies to the academic journal article where the claim originated. Writing assignment #3 will focus exclusively on the comparing and contrasting between the two article sources (as opposed to combining their evaluation of the academic article and comparisons into one massive assignment like I attempted this Fall, 2019). I think these changes will help to build the skills in the earlier, lower-stakes assignments, and give even more time to the more challenging aspects of these later assignments.

Threshold Achievement

Has the threshold been met?

Green 80% or higher; Yellow 70%-79%; Red >69%

○ *Not Met* ○ *Met* ◉ *Exceeded*

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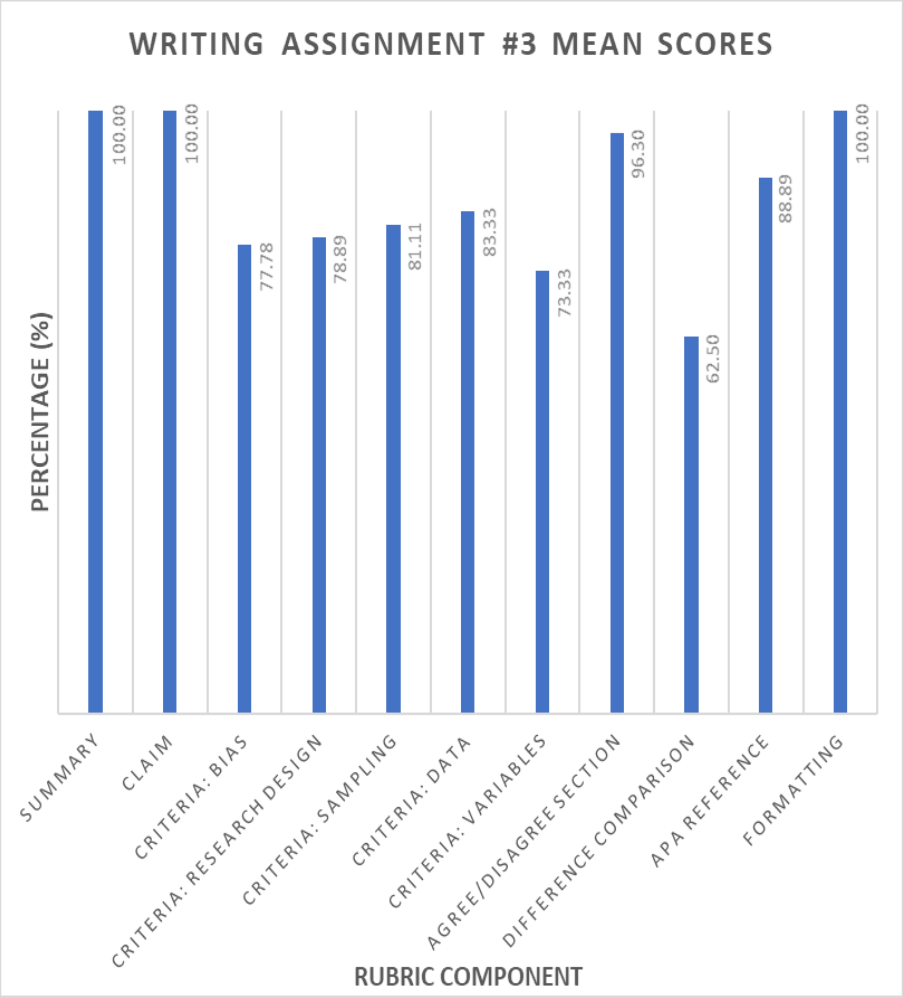
Assessment Reporting

Substantiating Evidence

What evidence supports the findings?



This figure represents the mean scores across students for the major graded components of the paper. The introduction section of the worksheet includes summarizing the topic/claim and stating their evaluation of the credibility of the claim in both popular press and academic journal article. The detailed analysis section of the worksheet involves thoroughly discussing the criteria used to support their arguments (broken up into 5 major criteria: Bias, Design, Sampling, Data, and Variables). The agree/disagree section of the worksheet asks students to talk about whether or not they believe the claim is scientifically valid. The explaining value of scientific writing section asks students to explain why there is a discrepancy between how a claim is portrayed in popular press articles and in academic articles. The formatting section includes proper formatting, sentence and paragraph structure, and APA references.

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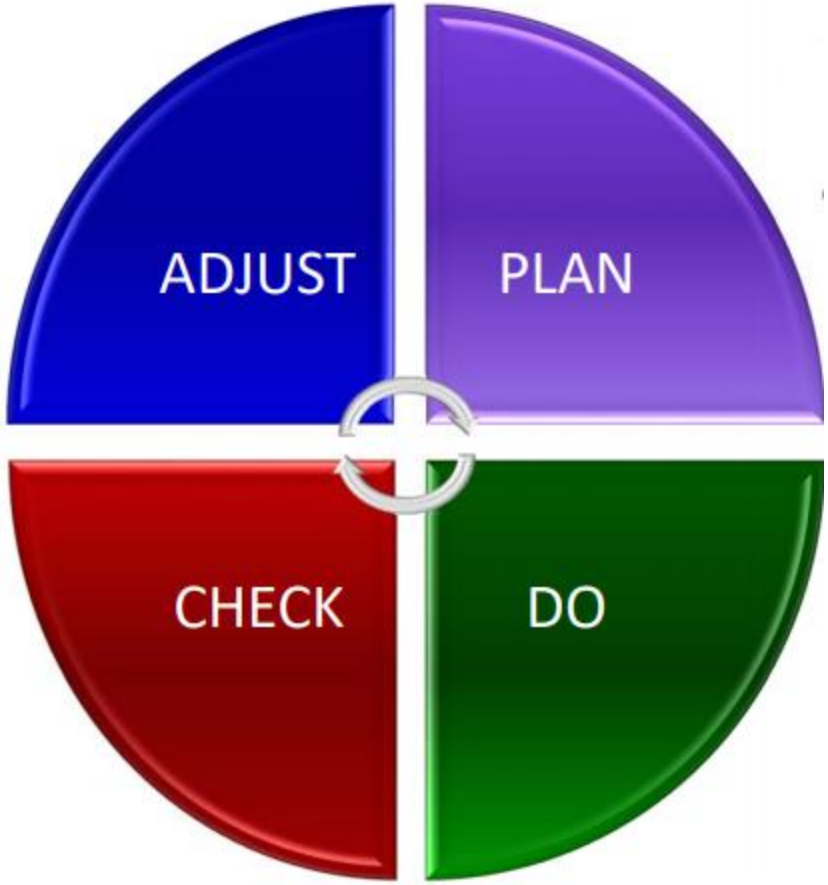
APPENDIX A

Student Learning Outcomes Assessment Plan (SLOAP)

- Adjust Instruction, Assessments, Outcomes



- Map Program/Discipline Outcomes
- Map General Education Outcomes

- Record Data Results
- Analyze Data Results

- Identify Assessment Methods
- Identify Measurable Criteria
- Assess Course, Program, Discipline, GSLO Outcomes

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Assessment Tasks 2019-2020

CTE and AAS/AS Degree Tasks	Due Date
Complete curriculum assessment map in Taskstream. Review with Dean and VPI.	November 1
Include the GSLO of Communication on each curriculum assessment map. Assess communication in one class this year using the Value Rubric in VIA.	June 11
Assess each program outcome this year. Program outcome reports are due the last day of finals week each term. Program outcomes will be assessed using VIA rubrics.	December 6 March 20 June 11
Identify 2 course per term in which to measure at least 2 student learning outcomes using any method of assessment that has meaning for you. Submit the course outcome report form each term to your dean.	December 6 March 20 June 11
Complete program review if applicable.	March 20
Complete annual review of data if not completing a program review.	March 20
Present program review to general faculty and ET.	May 27

LDC and AAOT/AGS Degree Tasks	Due Date
Complete AAOT/AGS and GSLO curriculum assessment map in Taskstream. Review with Dean and VPI.	November 1
Assess 2 AAOT outcomes per term. AAOT outcome reports are due the last day of finals week each term. AAOT and GSLO outcomes will be assessed using VIA rubrics.	December 6 March 20 June 11
Identify 2 courses per term in which to measure at least 2 student learning outcomes using any method of assessment that has meaning for you. Submit the course outcome report form each term to your dean.	December 6 March 20 June 11
Complete annual review of data for AAOT Foundational and/or Discipline studies outcomes.	March 20
Present program review to general faculty and ET.	May 27

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Assessment Tasks 2019-2020

Fall Assessment Training Calendar	
Taskstream for Beginners	October 2, 3 – 5 p.m.
Open Assessment and Taskstream Lab Time	October 3, 9-11:30 a.m. October 3, 1-4 p.m.
Open Assessment and Taskstream Lab Time	October 4, 9-11:30 a.m. October 4, 1-4 p.m.
Assessment Conversations – Division Meetings (Assessment handbook and forms will be distributed at this time)	October 9, 3 – 5 p.m.
VIA Refresher	October 16, 3 – 5 p.m.
Open Assessment and Taskstream Lab Time	October 24, 9-11:30 a.m. October 24, 1-4 p.m.
Open Assessment and Taskstream Lab Time	October 25, 9-11:30 a.m. October 25, 1-4 p.m.
Advanced Taskstream	October 30, 3 – 5 p.m.
Open Assessment Lab Time	December 4, 3 – 5 p.m.
Open Assessment and Taskstream Lab Time	December 5, 9-11:30 a.m. December 5, 1-4 p.m.
Open Assessment and Taskstream Lab Time	December 6, 9-11:30 a.m. December 6, 1-4 p.m.
Winter Assessment Training Calendar	
Taskstream for Beginner to Intermediate	January 8, 3 – 5 p.m.
Assessment Conversations – Division Meetings	January 22, 3 – 5 p.m.
VIA Refresher	January 30, 3 – 5 p.m.
Annual Data Review Training	February 12, 3 – 5 p.m.
Open Assessment Lab Time	March 18, 3 – 5 p.m.
Open Assessment and Taskstream Time	TBA
Spring Assessment Training Calendar	
Taskstream for Intermediate	April 1, 3 – 5 p.m.
Assessment Conversations – Division Meetings	April 15, 3 – 5 p.m.
VIA Refresher	May 13, 3 – 5 p.m.
Program Review at General Faculty	May 27, 3 - 5 p.m.
Open Assessment and Taskstream Time	TBA
Open Assessment Lab Time	June 9, 3 – 5 p.m.

VI. Learning Outcomes Assessment Data:

Exhibit VI.A: Review all learning outcomes assessment work plans developed in discipline or program.

Outcome 1	Measureable Criteria	Measurement Tool	Courses	Time Frame
Demonstrate knowledge of **chemical structure** to predict and explain the physical properties of chemical materials.	An average score of at least 80% or better on homework and 70% or better on homework and exam questions relating to **chemical structure**.	Homework, Exams	CHEM 110 CHEM 221 CHEM 222 CHEM 223	Data collection begins: 2015-2016 Analysis begins: 2016-2017

2015-2016 Results:

CHEM 221 – FL15	Average		Average		Average
HW Chp. 1	N/A	**HW Chp. 7**	87%	**Exam 1**	79%
HW Chp. 2	96%	**HW Chp. 8**	93%	**Exam 2**	70%
HW Chp. 3	N/A	**HW Chp. 9**	86%	**Final Exam**	
HW Chp. 4	N/A	**HW Chp. 10**	90%		

CHEM 110 – FL15	Average		Average		Average
HW Chp. 2	91%	**HW Chp. 8**	79%	**Exam 1**	80%
HW Chp. 3	97%	**HW Chp. 17**		**Exam 2**	57% (n=1)
HW Chp. 5	84%	**HW Chp. 19**		**Final Exam**	
HW Chp. 6	N/A	**HW Chp. 21**			

Analysis:

CHEM 221
Homework: 90%, Exams: 75%

CHEM 110
Homework: 88%, Exams: 69%

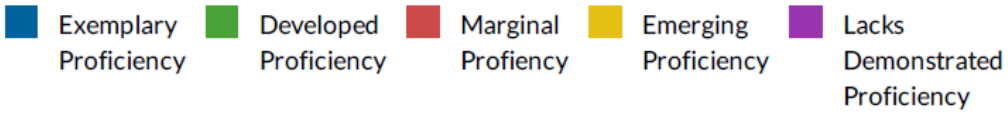
Plan:
I will continue to examine my teaching methodologies and exam and homework questions to improve these numbers.

Further, although students have met my standards, it is difficult to know whether they have met national standards. To compare student achievement in my courses to student achievement in General Chemistry courses nation-wide, I plan to administer an American Chemical Society approved exam for general chemistry at the conclusion of CHEM 223.

Outcome 1	Measureable Criteria	Measurement Tool	Courses	Time Frame
Demonstrate knowledge of **chemical structure** to predict and explain the physical properties of chemical materials.	**CHEM 110/GS 105/CHEM 221:** at least 75% achieve "emerging proficiency" **CHEM 222:** at least 75% achieve "marginal proficiency" **CHEM 223:** at least 75% achieve "developed proficiency" **CHEM 245/246/247:** at least 75% achieve "exemplary proficiency"	Homework, Exams, Chemical structure rubric, ACS Exam	GS 105 CHEM 110 CHEM 221 CHEM 222 CHEM 223 CHEM 245 CHEM 246 CHEM 247	Data collection begins: WT17 Analysis begins: SP17

2016-2017 winter Results:

WINTER 2017



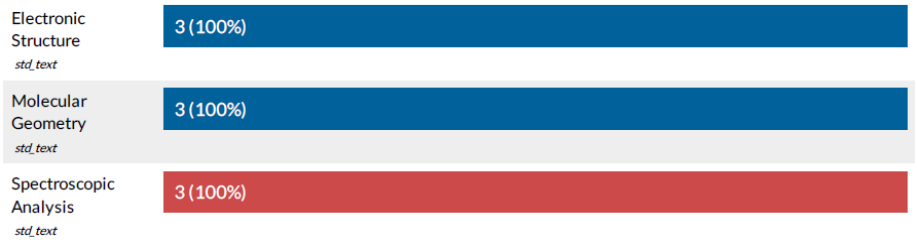
Rubric View: Chemical Structure Rubric **CHEM 110**

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Profiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Electronic Structure	0	0	21	0	2	1.826	2.000	0.564
Molecular Geometry	0	0	0	20	3	0.870	1.000	0.337
Spectroscopic Analysis	0	0	0	0	0	0.000	NA	0.000

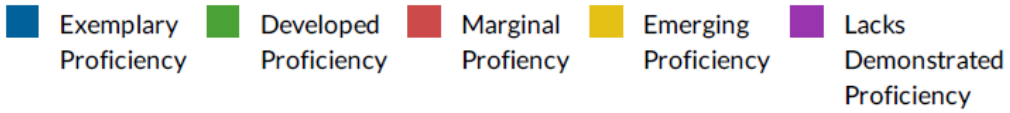
CHEM 110 GOAL:	WT17 RESULTS:
At least 75% of students achieve at least "emerging proficiency"	**88.5%** of students achieved at least "emerging proficiency"

Rubric View: Chemical Structure Rubric **CHEM 246**

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Profiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Electronic Structure	3	0	0	0	0	4.000	4.000	0.000
Molecular Geometry	3	0	0	0	0	4.000	4.000	0.000
Spectroscopic Analysis	0	0	3	0	0	2.000	2.000	0.000



CHEM 246 GOAL:	**WT17 RESULTS:**
At least 75% of students achieve at least "exemplary proficiency"	**100%** of students achieved at least "exemplary proficiency"



Rubric View: Chemical Structure Rubric **GS 105**

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Profiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Electronic Structure	0	17	2	0	0	2.895	3.000	0.307
Molecular Geometry	0	0	17	2	0	1.895	2.000	0.307
Spectroscopic Analysis	0	0	0	0	0	0.000	NA	0.000

GS 105 GOAL:	**WT17 RESULTS:**
At least 75% of students achieve at least "emerging proficiency"	**100%** of students achieved at least "emerging proficiency"

2016-2017 Winter Results

RESULTS: 100% of students in both CHEM 246 and GS 105 achieved the desired level of performance in the categories of chemical structure. 88.5% of students in CHEM 110 achieved the desired level of performance with regards to chemical structure.

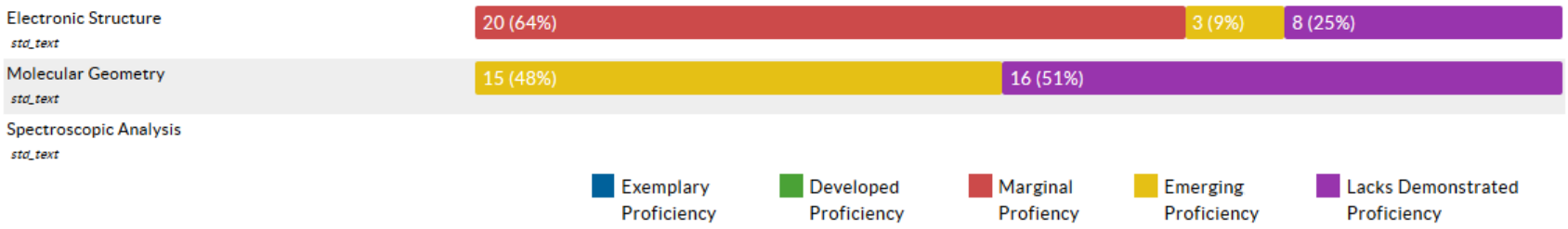
ANALYSIS: Although a majority of students scored at the desired level of performance in this exercise, I believe that there is more work to be done. I do believe that these data reflect the true abilities of my students in this category, as I have been sufficiently impressed with their understanding of chemical structure. However, the data seem to indicate that nearly all of the students in the course are achieving at the same level; I do not necessarily believe this result. I think that the problem lies within the chemical structure rubric; if it were designed more carefully, it could be used to investigate these differences in abilities between students in the same course, even if they are achieving at the desired performance level.

PLAN: This initial assessment is promising, but I believe that students can perform even better in this area. I will take another look at the "chemical structure rubric" to see if I can change the wording of each category to better match student performance and to better tease out small differences in performance among students in the same course. Another possibility is to increase the measurable criteria for this outcome; rather than expecting 75% to perform better than "marginal proficiency", perhaps I should expect 75% to perform at or better than "developed proficiency".

SPRING 2017
CHEM 110

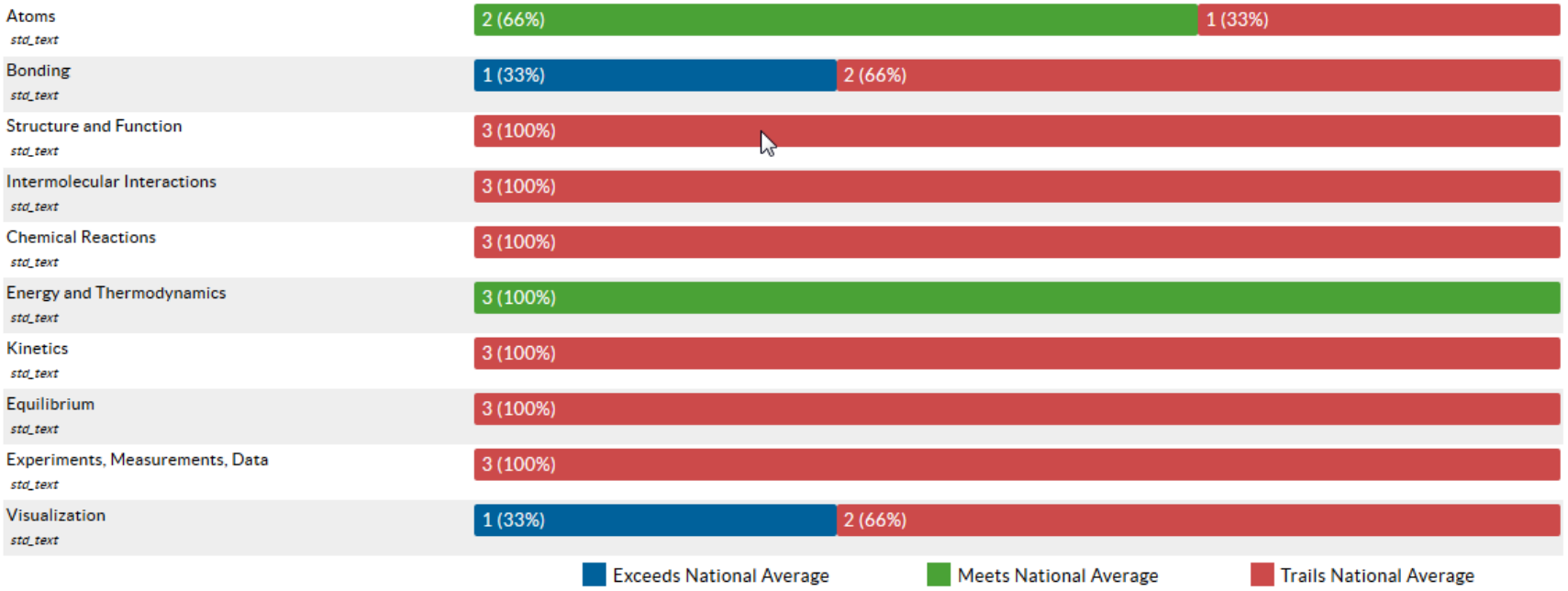
Rubric View: Chemical Structure Rubric

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Profiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Electronic Structure	0	0	20	3	8	1.387	2.000	0.868
Molecular Geometry	0	0	0	15	16	0.484	0.000	0.500
Spectroscopic Analysis	0	0	0	0	0	0.000	NA	0.000



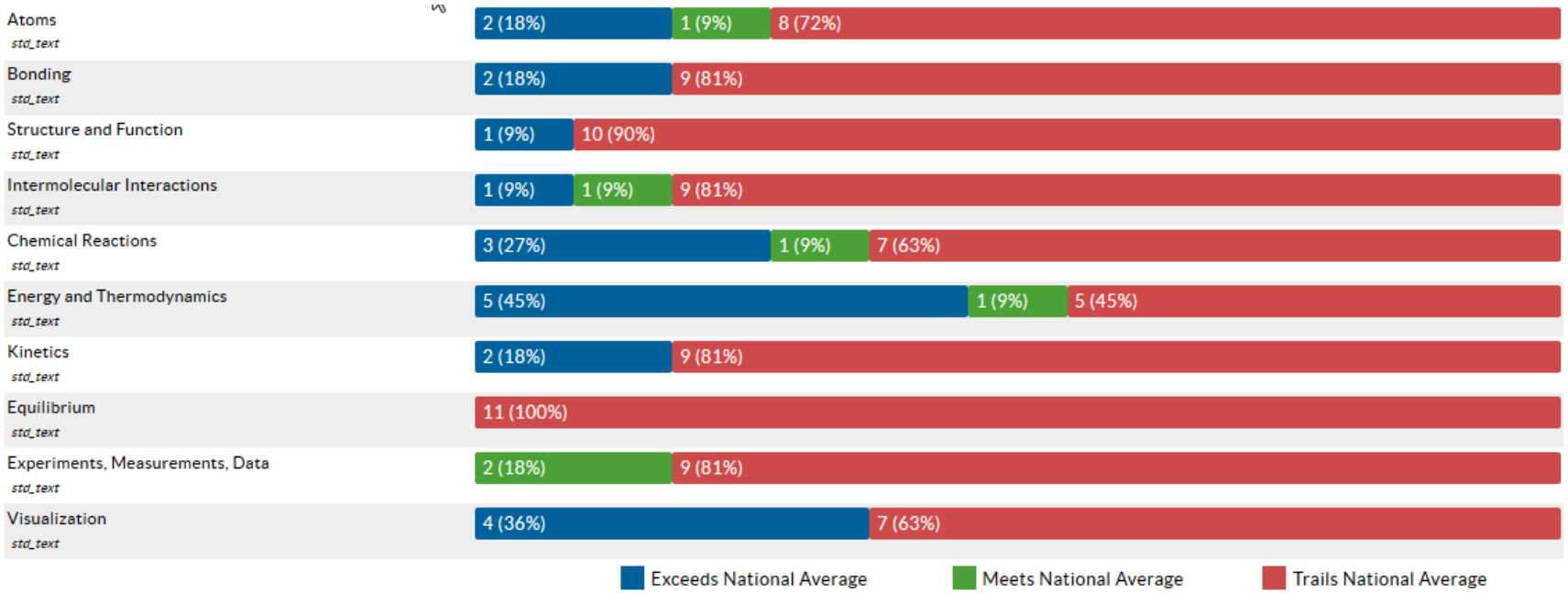
CHEM 110 GOAL:	**SP17 RESULTS:**
At least 75% of students achieve at least "emerging proficiency"	**60.5%** of students achieved at least "emerging proficiency"

CHEM 223-01



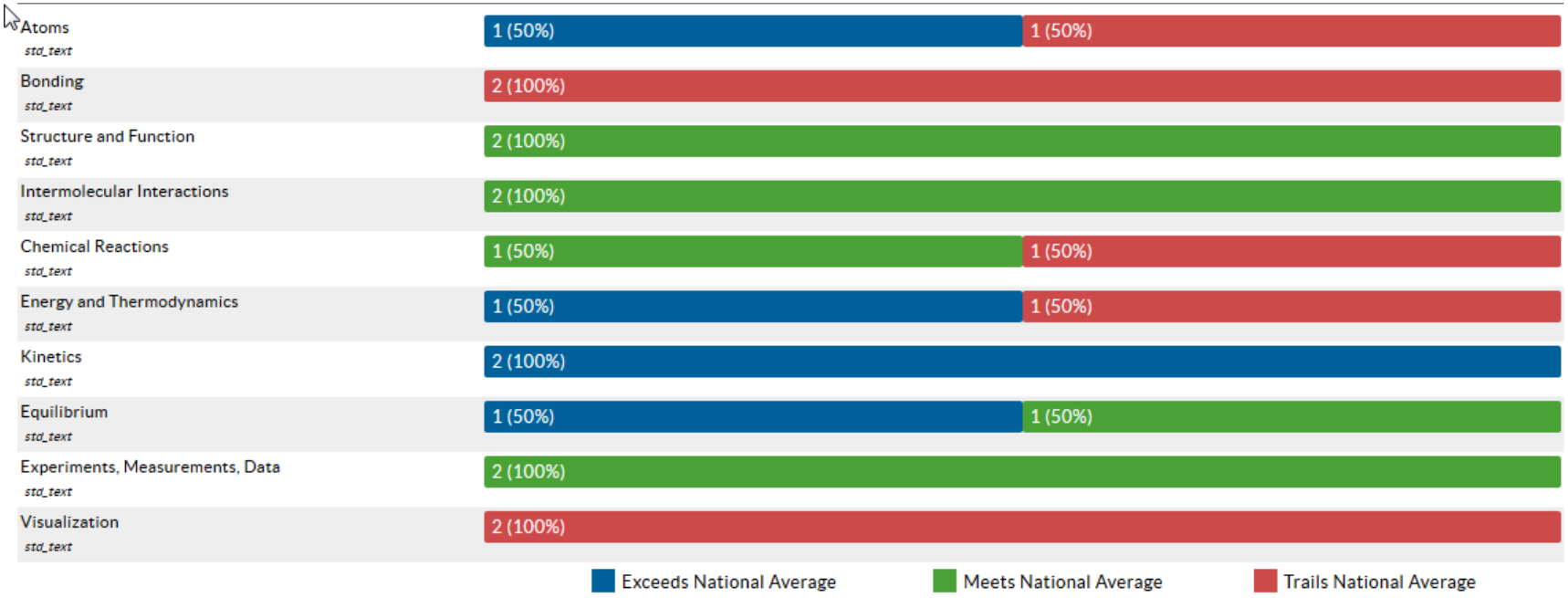
CHEM 223 GOAL:	**SP17 RESULTS:**
At least 75% of students achieve at least "meets national average"	**Many areas met national average, but many areas were trailing national average**

CHEM 223-02



CHEM 223 GOAL:	**SP17 RESULTS:**
At least 75% of students achieve at least "meets national average"	**Many areas met national average, but many areas were trailing national average**

CHEM 247



CHEM 247 GOAL:	SP17 RESULTS:
At least 75% of students achieve at least "meets national average"	**Many areas met national average, but many areas were trailing national average**

2016-2017 Spring Results

RESULTS: Although many areas were at or above the national average, there were many areas that were below the national average.

ANALYSIS: Many of the chemistry concepts were covered well, but students were not adequately prepared for the math portion of the course and many of the areas where students fell below the national average were “math-heavy” concepts.

PLAN: I am working with the math department to coordinate certain topics from the chemistry sequence so that they can be reinforced within math courses. We are working to coordinate the schedule of certain topics across chemistry, math, and physics, so that concepts can be introduced in one course, and reinforced in the other courses, both in terms of when the topics are introduced, as well as the specific content of assignments.

Outcome 2	Measureable Criteria	Measurement Tool	Courses	Time Frame
Demonstrate knowledge of **chemical reactivity** to predict and explain the outcomes of reactions.	An average score of at least 80% or better on homework and 70% or better on homework and exam questions relating to **chemical reactivity**.	Homework, Exams, ACS Exam	CHEM 110 CHEM 221 CHEM 222 CHEM 223	Data collection begins: 2015-2016 Analysis begins: 2016-2017

Results:

CHEM 221 – FL15	Average		Average		Average
HW Chp. 1	N/A	**HW Chp. 7**	N/A	**Exam 1**	86%
HW Chp. 2	N/A	**HW Chp. 8**	N/A	**Exam 2**	86%
HW Chp. 3		**HW Chp. 9**	N/A	**Final Exam**	
HW Chp. 4		**HW Chp. 10**	N/A		

CHEM 110 – FL15	Average		Average		Average
HW Chp. 2	N/A	**HW Chp. 8**	79%	**Exam 1**	82%
HW Chp. 3	N/A	**HW Chp. 17**		**Exam 2**	83%
HW Chp. 5	N/A	**HW Chp. 19**		**Final Exam**	
HW Chp. 6	88%	**HW Chp. 21**			

Analysis:

CHEM 221
Homework: N/A, Exams: 86%

CHEM 110
Homework: 84%, Exams: 82%

Plan:

I will continue to examine my teaching methodologies and exam and homework questions to improve these numbers.

Further, although students have met my standards, it is difficult to know whether they have met national standards. To compare student achievement in my courses to student achievement in General Chemistry courses nation-wide, I plan to administer an American Chemical Society approved exam for general chemistry at the conclusion of CHEM 223.

Outcome 3	Measureable Criteria	Measurement Tool	Courses	Time Frame
Demonstrate knowledge of **chemical quantitation** to predict and explain chemical phenomena.	An average score of at least 80% or better on homework and 70% or better on exam questions relating to **chemical quantitation**.	Homework, Exams, ACS Exam	CHEM 110 CHEM 221 CHEM 222 CHEM 223	Data collection begins: 2015-2016 Analysis begins: 2016-2017

Results:

CHEM 221 – FL15	Average		Average		Average
HW Chp. 1	97%	**HW Chp. 7**	N/A	**Exam 1**	N/A
HW Chp. 2	N/A	**HW Chp. 8**	N/A	**Exam 2**	N/A
HW Chp. 3	N/A	**HW Chp. 9**	N/A	**Final Exam**	
HW Chp. 4	N/A	**HW Chp. 10**	N/A		

CHEM 110 – FL15	Average		Average		Average
HW Chp. 2	93%	**HW Chp. 8**	79%	**Exam 1**	N/A
HW Chp. 3	N/A	**HW Chp. 17**		**Exam 2**	68%
HW Chp. 5	N/A	**HW Chp. 19**		**Final Exam**	
HW Chp. 6	88%	**HW Chp. 21**			

Analysis:

CHEM 221
Homework: 97%, Exams: N/A

CHEM 110
Homework: 87%, Exams: 68%

Plan:

I will continue to examine my teaching methodologies and exam and homework questions to improve these numbers.

Further, although students have met my standards, it is difficult to know whether they have met national standards. To compare student achievement in my courses to student achievement in General Chemistry courses nation-wide, I plan to administer an American Chemical Society approved exam for general chemistry at the conclusion of CHEM 223.

Outcome 4	Measureable Criteria	Measurement Tool	Courses	Time Frame
Critical Thinking: Collect and analyze data using classical methods and modern instrumentation and evaluate experimental results using the principles of the scientific method.	An average score of at least a 70% or better on correct identification of unknowns.	Identification of Unknowns, VALUE Rubric: Critical Thinking	CHEM 221 CHEM 222 CHEM 223	Data collection begins: 2015-2016 Analysis begins: 2016-2017

2015-2016 Results:

Results:

	Average
CHEM 221 (FL15)	(no data)
CHEM 222 (WT16)	72%
CHEM 223 (SP16)	63%

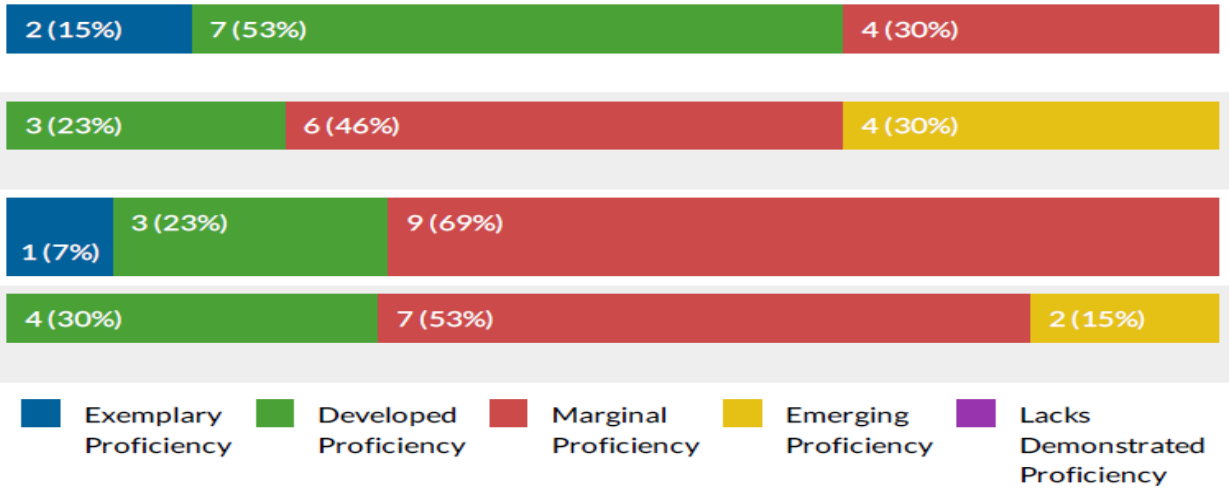
Analysis:
Average = 67.5%

Plan:
These numbers indicate that students are having a hard time "connecting the dots," as it were, with regard to analysis of experimental data. To improve these numbers, I will continue to work with my students to help them identify the important aspects of a situation and to avoid fallacies of logic and critical thinking.

2016-2017 Results:

Rubric View: Chemistry Lab Report Rubric **CHEM 222**

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Proficiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Introduction / Background Info	2	7	4	0	0	2.846	3.000	0.662
Literature Evidence	0	3	6	4	0	1.923	2.000	0.730
Data and Results	1	3	9	0	0	2.385	2.000	0.625
Discussion and Conclusion	0	4	7	2	0	2.154	2.000	0.662



% scoring at least "marginal proficiency"
Data and Results 100%
Discussion and Conclusion 83%

2016-2017 Winter Results

RESULTS: 100% and 83% of students in CHEM 222 scored at least a "marginal proficiency" in the categories of "data and results" and "discussion and conclusion", respectively, of the chemistry laboratory report rubric.

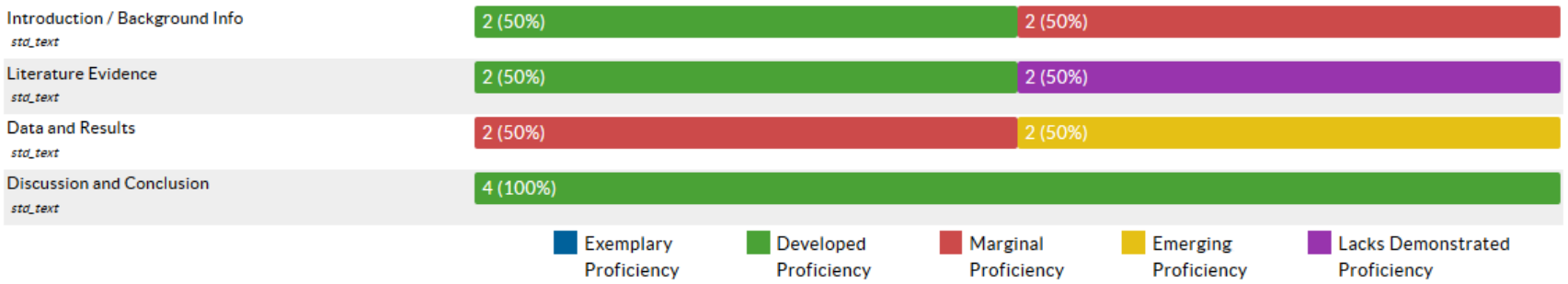
ANALYSIS: Although a majority of students scored above marginal proficiency in this exercise, I believe that there is more work to be done. My feeling is that students are not performing at the necessary level with regard to interpreting and analyzing experimental results; the fact that my data do not support this feeling suggests that I scored students too high when assessing their work or that I should expect more than "marginal proficiency" from these students.

PLAN: Although this initial assessment is promising, I believe that students can perform even better in this area. I will take another look at the "lab report rubric" to see if I can change the wording of each category to better match student performance. Another possibility is to increase the measurable criteria for this outcome; rather than expecting 75% to perform better than "marginal proficiency", perhaps I should expect 75% to perform at or better than "developed proficiency".

CHEM 223-01

Rubric View: Chemistry Lab Report Rubric

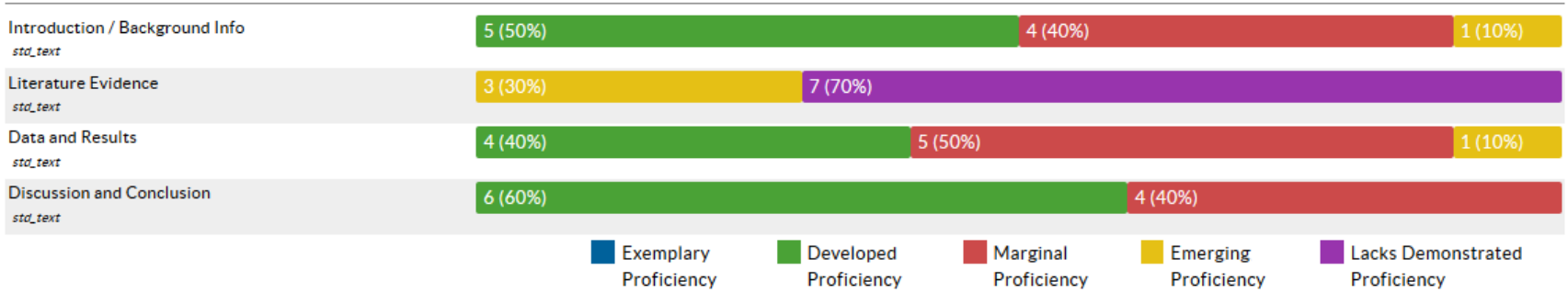
	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Proficiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Introduction / Background Info	0	2	2	0	0	2.500	2.000	0.500
Literature Evidence	0	2	0	0	2	1.500	0.000	1.500
Data and Results	0	0	2	2	0	1.500	1.000	0.500
Discussion and Conclusion	0	4	0	0	0	3.000	3.000	0.000



CHEM 223-02

Rubric View: Chemistry Lab Report Rubric

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Proficiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Introduction / Background Info	0	5	4	1	0	2.400	3.000	0.663
Literature Evidence	0	0	0	3	7	0.300	0.000	0.458
Data and Results	0	4	5	1	0	2.300	2.000	0.640
Discussion and Conclusion	0	6	4	0	0	2.600	3.000	0.490



2016-2017 Spring Results

RESULTS: In CHEM 223-01, 50% of students received a score of "marginal proficiency" in data and results and 100% of students received a score of "developed proficiency" in discussion and conclusions. In CHEM 223-02, 90% of students received a score of "marginal proficiency" or better in data and results and 100% of students scored "marginal proficiency" or better in discussion and conclusions.

ANALYSIS: Students performed well on this learning outcome. This term in CHEM 223, we had a 10-week project where students were able to make a hypothesis, collect data, interpret the results, and write a lab report. Students were able to successfully collect and interpret their data. I think that there are several reasons that this term went better than last term: 1) the students had more practice from CHEM 221/222; 2) the entire lab sequence was based on one project, so students could keep adding to their knowledge week after week instead of starting a new experiment every week; 3) students were told to work independently, so they weren't as able to rely on their partner's work.

PLAN: Moving forward, I would like to create more term-long laboratory projects. It seems that having an open-inquiry, on-going lab project was conducive to critical thinking. I will design term-long lab projects for CHEM 221, 222, 245, 246, and 247.

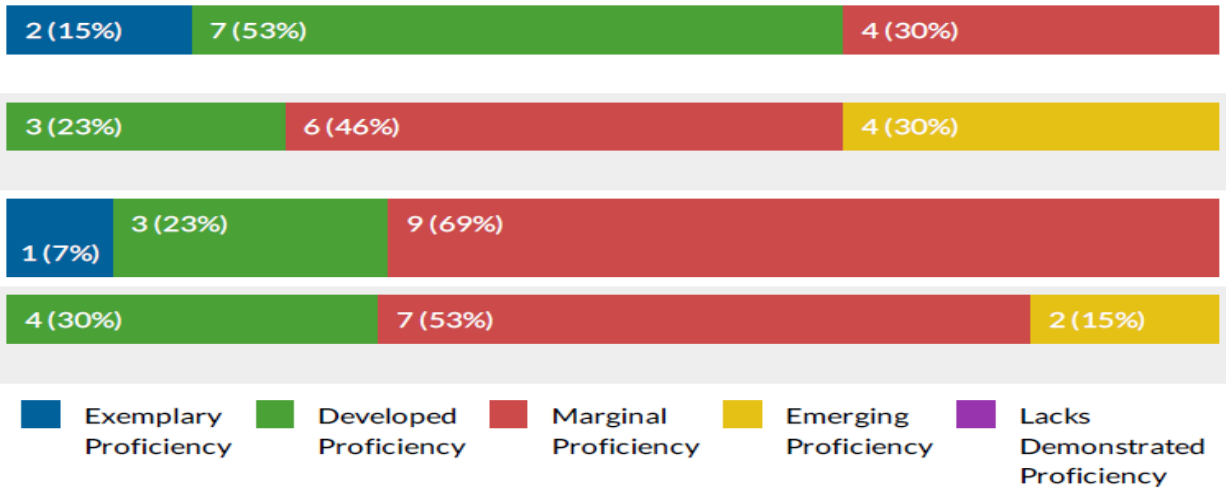
Outcome 5	Measureable Criteria	Measurement Tool	Courses	Time Frame
Information Literacy: Locate, summarize, and critique scientific articles, as well as synthesize scientific information from various sources to communicate the results of their own experiments.	At least 75% of students will achieve at least "Marginal Proficiency" on the Chemistry Lab Report Rubric in the categories of "Introduction/Background Info" and "Literature Evidence"	Lab report, VALUE Rubric: Information Literacy	CHEM 222	Data collection begins: WT17 Analysis begins: SP17

2016-2017 Results:

Rubric View: Chemistry Lab Repor **CHEM 222**

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Proficiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Introduction / Background Info	2	7	4	0	0	2.846	3.000	0.662
Literature Evidence	0	3	6	4	0	1.923	2.000	0.730
Data and Results	1	3	9	0	0	2.385	2.000	0.625
Discussion and Conclusion	0	4	7	2	0	2.154	2.000	0.662

% scoring at least "marginal proficiency"	
Intro/Background Info	100%
Literature Evidence	69%



2016-2017 Winter Results

RESULTS: 100% and 69% of students in CHEM 222 scored at least a "marginal proficiency" in the categories of "intro/background information" and "literature evidence", respectively, of the chemistry laboratory report rubric.

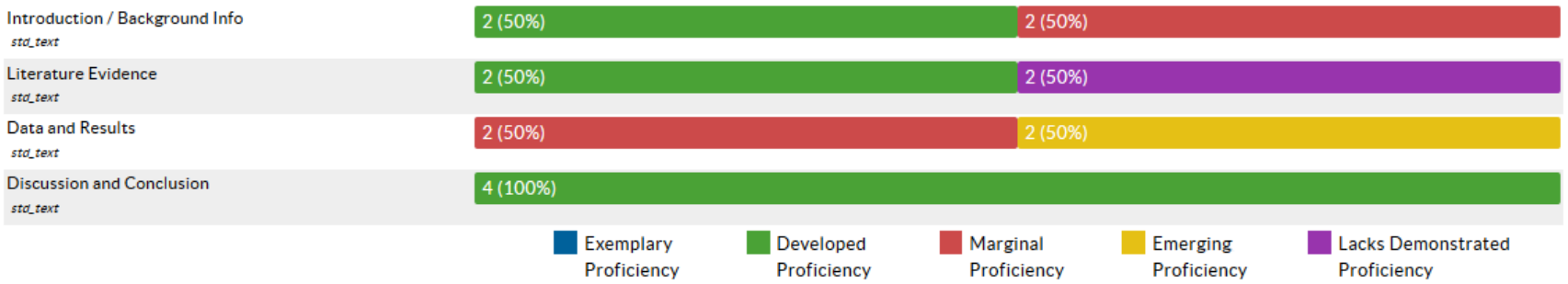
ANALYSIS: Since 100% of students were able to score at least "marginal proficiency" in the area of "introduction/background information", perhaps I should increase the expected performance level. It seems that 68% of students were able to score at least "developed proficiency" in this area. I will look into changing the measurable criteria for this outcome. However, only 69% of students were able to score at least "marginal proficiency" in the area of "literature evidence". This suggests that students are having a difficult time either finding or properly utilizing peer-reviewed articles from the scientific literature when writing their lab reports. This is an essential component of a modern STEM education, so it is imperative that more emphasis is placed on this skill to increase the number of students performing at least at the "marginal proficiency" level. I will reach out to the librarian on campus to suggest the possibility of using a laboratory period to explore the library databases and locate and evaluate peer-reviewed articles.

PLAN: Although this initial assessment is promising, I believe that students can perform even better in this area. I will take another look at the "lab report rubric" to see if I can change the wording of each category to better match student performance. If it turns out that the rubric is capable of capturing the different levels of achievement as currently formatted, then another possibility is to increase the expected measurable criteria for each student outcome; perhaps I am underestimating what I can expect students at this level to accomplish. Therefore, another possibility is to increase the measurable criteria for this outcome; rather than expecting 75% to perform better than "marginal proficiency", perhaps I should expect 75% to perform at or better than "developed proficiency".

CHEM 223-01

Rubric View: Chemistry Lab Report Rubric

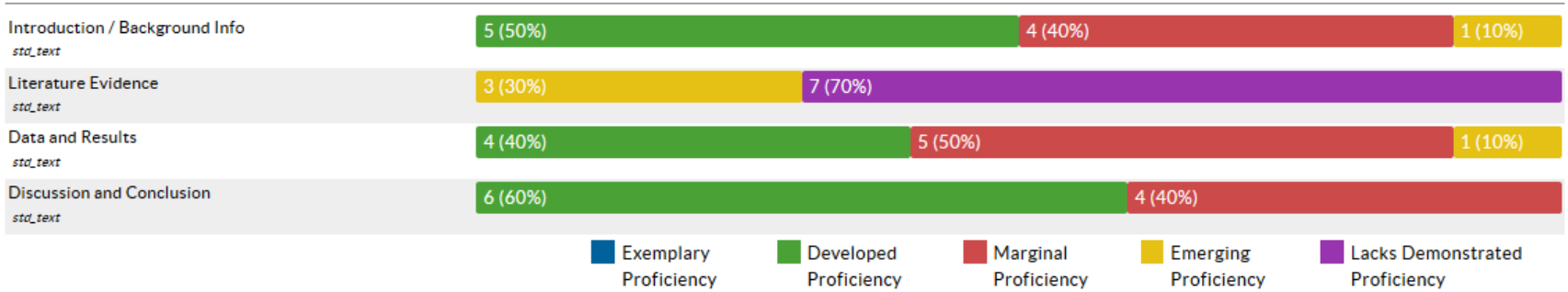
	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Proficiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Introduction / Background Info	0	2	2	0	0	2.500	2.000	0.500
Literature Evidence	0	2	0	0	2	1.500	0.000	1.500
Data and Results	0	0	2	2	0	1.500	1.000	0.500
Discussion and Conclusion	0	4	0	0	0	3.000	3.000	0.000



CHEM 223-02

Rubric View: Chemistry Lab Report Rubric

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Proficiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Introduction / Background Info	0	5	4	1	0	2.400	3.000	0.663
Literature Evidence	0	0	0	3	7	0.300	0.000	0.458
Data and Results	0	4	5	1	0	2.300	2.000	0.640
Discussion and Conclusion	0	6	4	0	0	2.600	3.000	0.490



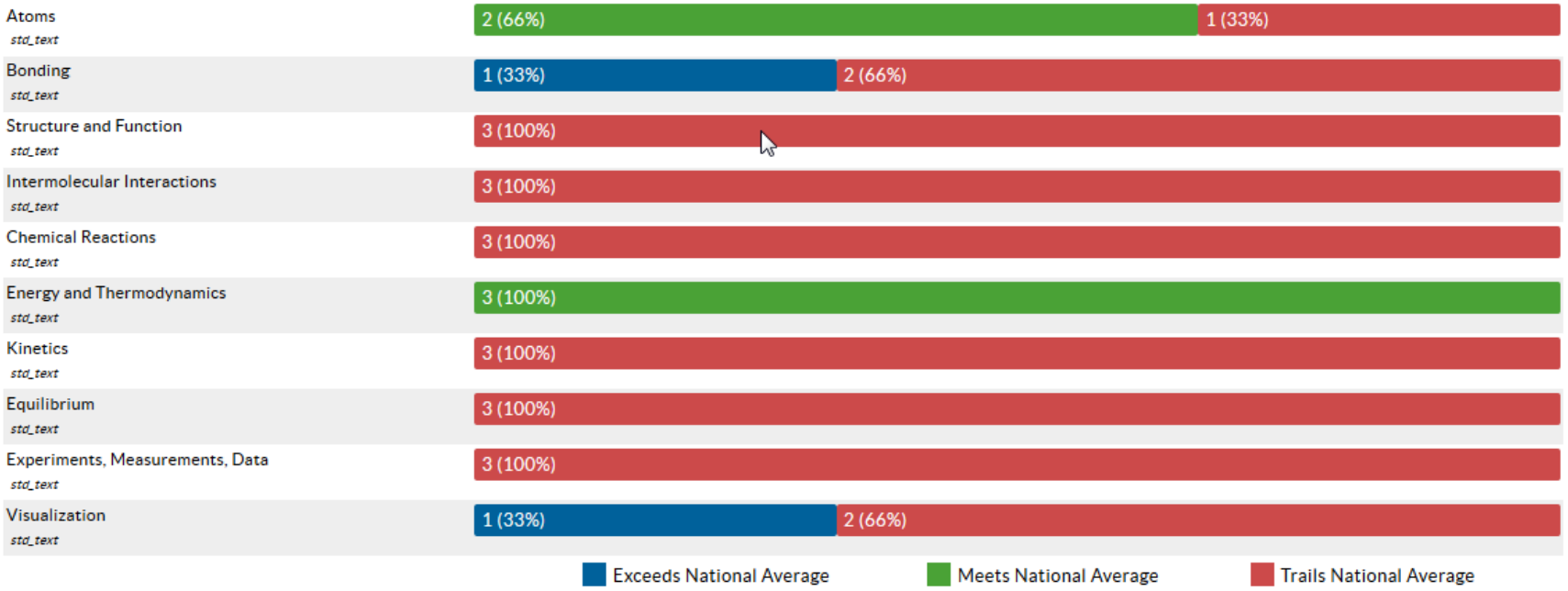
2016-2017 Spring Results

RESULTS: In CHEM 223-01, 100% of students scored at least marginal proficiency in introduction/background info and 50% of students scored developed proficiency in literature evidence. In CHEM 223-02, 90% of students scored at least marginal proficiency in introduction/background info and 0% of students scored marginal proficiency in literature evidence.

ANALYSIS: Students seem to have understood the components of a good introduction for a lab report. They were consistently able to explain what the experiment was about and why it was important. However, they were not very good at supporting this information using some outside source (literature evidence).

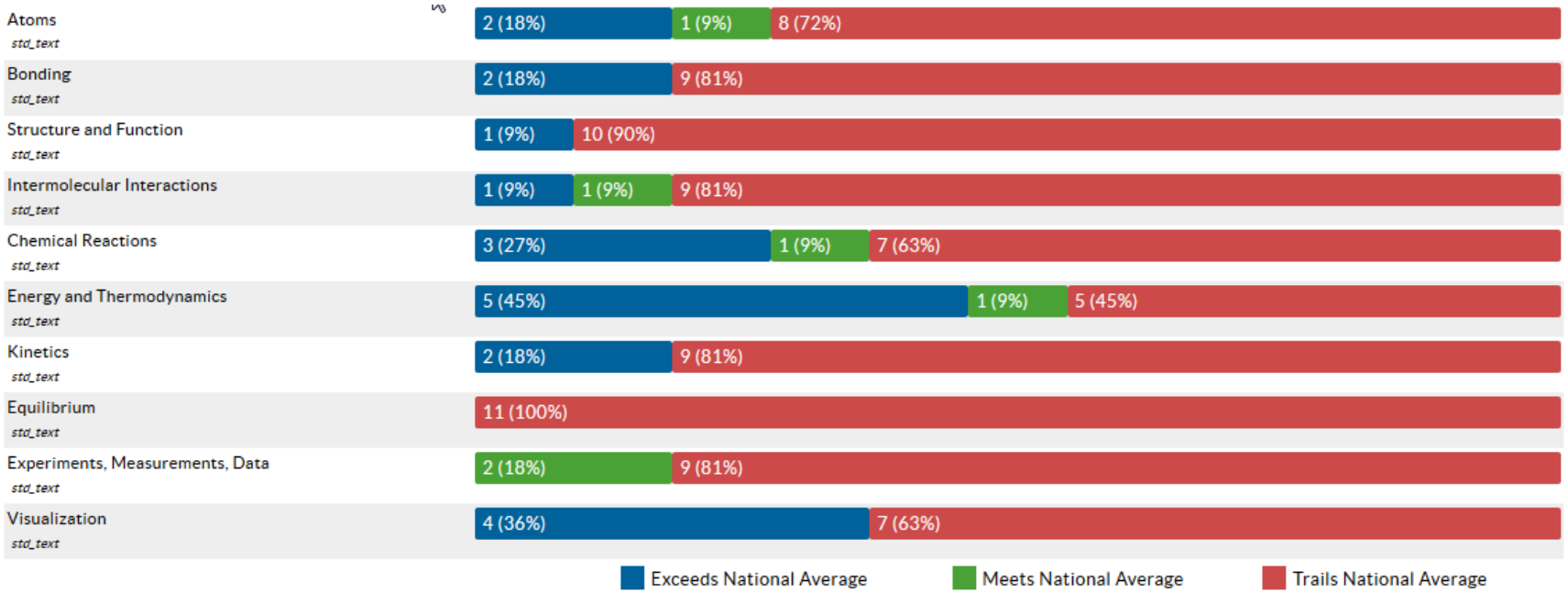
PLAN: I will work with the library to develop a module for my students to learn about computer databases and how to find relevant information for papers and lab reports. I will also introduce students to more peer-reviewed articles so they can start to see how literature evidence is used in professional papers.

CHEM 223-01



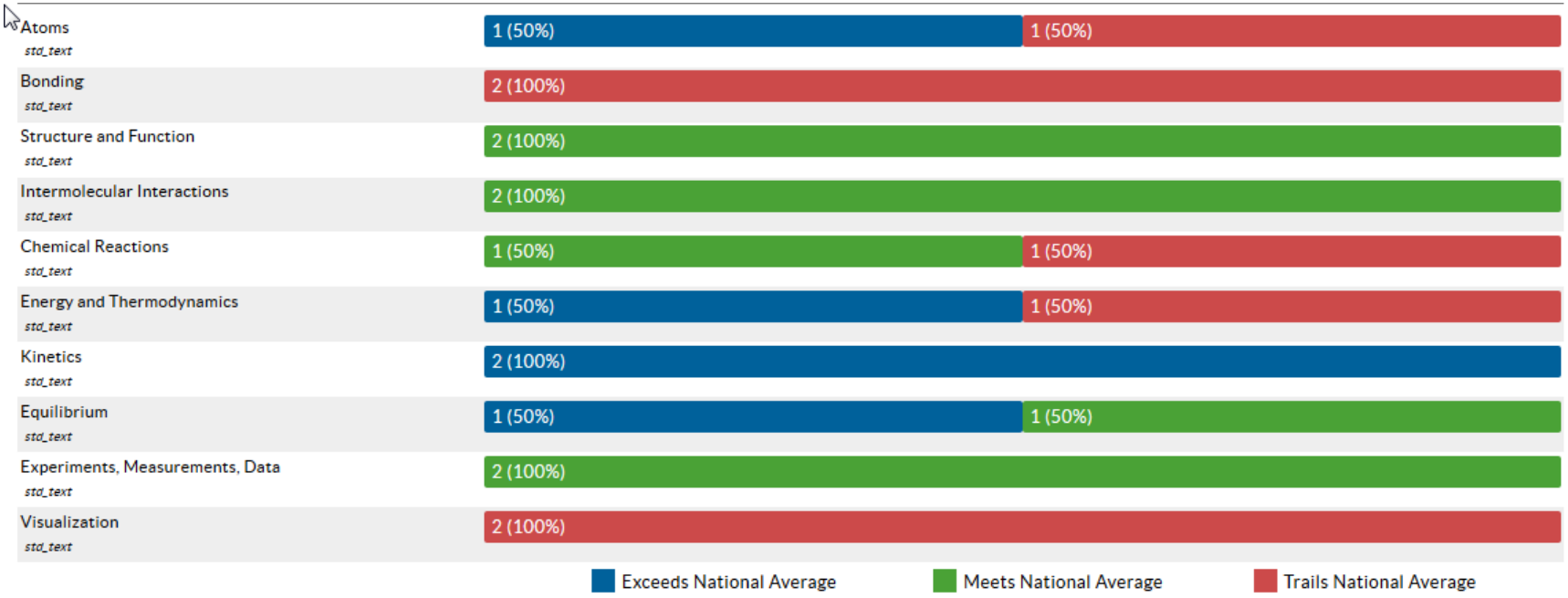
CHEM 223 GOAL:	**SP17 RESULTS:**
At least 75% of students achieve at least "meets national average"	**Many areas met national average, but many areas were trailing national average**

CHEM 223-02



CHEM 223 GOAL:	**SP17 RESULTS:**
At least 75% of students achieve at least "meets national average"	**Many areas met national average, but many areas were trailing national average**

CHEM 247



CHEM 247 GOAL:	SP17 RESULTS:
At least 75% of students achieve at least "meets national average"	**Many areas met national average, but many areas were trailing national average**

Outcome 6	Measureable Criteria	Measurement Tool	Courses	Time Frame
Global Learning: Demonstrate personal and social responsibility, environmental stewardship, and global self-awareness.	Student responses on survey	VALUE Rubric: Global Learning	GS 105 CHEM 221 CHEM 222 CHEM 223	Data collection begins: FL17 Analysis begins: FL17

Results: N/A

Analysis: N/A

Plan: To assess this learning outcome, a research report assignment has been created that asks students to choose one of the social/global issues that we discussed during class, like pollution or climate change, and to investigate further. This report will be assessed by using the VALUE rubric for Global learning. The plan is to assess this learning outcome for the first time at the end of CHEM 223 and CHEM 247 in Spring 2018.

Business / Accounting Department 2018-2019

Program: AAS Accounting

	Fall 2018	Winter 2019	Spring 2019
Program Outcome	4. Identify and record business transactions .	8. Prepare budgets, payroll, and other quarterly tax reports	10. Use current and emerging technologies and software to solve workplace problems.
Measure Title	Final Exam	Spreadsheet assignments	Final Exam - Capital rationing problem
Measure Type	Direct – Exam	Direct – Student artifact	Direct – Student artifact
Measure Level	Program		
Indicator / thresholds	75% of all students will earn a C (70% of project points) or better		
Course	BA211	BA212	BA213
Purpose/Meaning	Students need to master fundamental concepts of accounting to successfully continue and complete the program.	Mastery of secondary concepts enable students to develop facility with more complex principles.	Students demonstrate successfully navigation of the problem solving process and clearly communicate the results using industry standard software.
Key personnel	L. Stagg-Brown		
Summary of Findings	80% of students achieved a score of 70% or higher on the final exam. This left 20% receiving less than the 70% threshold. 60% achieved 80% or higher and 20% achieved 90% or higher.	90% of students achieved a score of 70% or higher on the final exam. This left 10% receiving less than the 70% threshold. 80% achieved 80% or higher and 50% achieved 90% or higher.	100% of students achieved a score of 70% or higher on the final exam. This left 0% receiving less than the 70% threshold. 86% achieved 80% or higher and 71% achieved 90% or higher.
Reflection Analysis	The introductory accounting course provides students with an important insight into potential career opportunities. It is generally agreed to be successful in general business or accounting specific professions, one needs an understanding the basic mechanisms of the accounting equation.	Students add to their basic accounting knowledge with more complex concepts such as payroll calculations and budgeting. The high level of student achievement suggests that the design and presentation of increasingly complex topics supports student success.	Students in this last course in the accounting sequence are increasingly competent in using standard accounting software to apply appropriate calculations to make decisions. The high level of student achievement suggests that the design and presentation of increasingly complex topics supports student success.
Threshold Achievement	The threshold was met	The threshold was met	The threshold was met

Substantiating Evidence	Spreadsheet with summary scores.

BA211 - F19
FINAL EXAM

FINAL EXAM BA211 F19

%	Let	Pts	Tot
65	D	65	100
65	D	65	100
70	C	70	100
70	C	70	100
83	B	83	100
85	B	85	100
85	B	85	100
85	B	85	100
90	A	90	100
90	A	90	100

70%<	80.0%
80%<	60.0%
90%<	20.0%
<70%	30%

BA212 - W19
STUDENT ARTIFACT - PAYROLL MODULE

5	20	10	10	**45**	100%	-
5	16.2	0	0	**21.2**	47%	F
5	9.2	10	9.8	**34**	76%	C
5	12	10	9.8	**36.8**	82%	B
5	12.4	10	9.6	**37**	82%	B
5	14.2	10	9	**38.2**	85%	B
5	16.8	10	8.8	**40.6**	90%	A
5	16.8	10	9.8	**41.6**	92%	A
5	18.6	10	8.8	**42.4**	94%	A
5	18.4	10	10	**43.4**	96%	A
5	20	10	9.8	**44.8**	100%	A

70%<	90%
80%<	80%
90%<	50%
<70%	10%

BA213 - SP19
STUDENT ARTIFACT/ - CAPITAL RATIONING

20	100.0%	
18.4	92.0%	A
17.6	88.0%	B
20	100.0%	A
14	70.0%	C
19	95.0%	A
18.4	92.0%	A
20	100.0%	A

70%<	100%
80%<	86%
90%<	71%
<70%	0%

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Assessment Reporting

Purpose

At Southwestern, we assess our course, program, and GSLO student learning outcomes, and both assessment and reporting programs assist us as we document and report what we do. These programs insure complete and consistent reporting. This document serves as a guide and worksheet for faculty as they prepare outcome assessment reports. Another document will focus on using these reports to generate student learning assessment project plans to close the loop.

Location

Enter the reporting software TaskStream, and click on your discipline's **Program Review—Academic** link. On the left menu bar, locate the tab **2018-2019 Annual Outcome Results: Plan/Budget 2020-2021.** Under that section, click on and respond first to the prompts for **SLO & Operational Outcomes Indicators 18-19** then next to the prompts for **Results: SLO & Oper. Indicators 18-19**.

OUTCOME ASSESSMENT REPORTS

Outcome

Which program or course outcome is being measured or assessed?
Plan, design, develop, and edit digital images and graphics.

Measure Title

What is being measured within that outcome?
Use of appropriate tools, techniques, and workflow.

Measure Type/Method

Which type of method is used to measure the outcome?

Direct—Student Artifact	Indirect—Survey
Direct—Exam	Indirect—Focus Group
Direct—Portfolio	Indirect—Interview
Direct—Other	Indirect—Other

Direct—Student Artifact

Measure Level

Which outcome level is being measured?

Course	Institution (GSLO)
Program	Other

Program

Indicator (Measurement)

How is the outcome to be measured?
Measured by the percentage of students who achieve Emerging Proficiency or higher on the "Effectively apply appropriate beginning and intermediate software techniques" rubric for CIS125PH.

Thresholds

Which levels determine achievement?
Determine the levels of achievement

- Green—achieved proficiency
- Yellow—approaching proficiency
- Red—lacking proficiency

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Assessment Reporting

Thresholds

- Green 85% or higher
- Yellow 75%-84%
- Red >74%

Purpose and Meaning

What is the significance of this indicator?
A strong indicator of student control over the design process as it pertains to digital images and graphics. This includes ideation, planning, selecting appropriate tools/techniques, file management, and publishing.

Key/Responsible Personnel

Who assesses this outcome?
Digital Design Faculty

Summary of Findings

What are the measurement results?
In fall 2018, CIS125PH, 100% of students reached a minimum of Emerging Proficiency for the ability to "effectively apply appropriate beginning and intermediate software techniques for given digital design challenges."

87.5% of students achieved Exemplary Proficiency; 12% achieved Demonstrates Proficiency; 0.5% or 1 student achieved Emerging Proficiency. The project focused on using Layer Blend Modes, Brush Tool, and Color Picker to colorize a vintage photograph. The students were excited about the project brief, and the ability to select their own vintage photograph translated into strong engagement.

Reflection, Analysis and Data Evidence

What do the results reveal?
Students in CIS125PH are able to successfully "plan, design, develop, and edit digital images and graphics." The course provides them with exposure to a wide range of tools/techniques and challenges them to employ the aforementioned to achieve creative objectives. I have put a tremendous amount of work in designing this course, and I feel that it has translated into a high level of student achievement.

Exemplary Proficiency represents flawless execution using the relevant tools. I provide detailed screencasts that demonstrate how to accomplish this. I was very pleased that 87.5% of the class achieved this level in 2018.

Projects at the Demonstrates Proficiency level include a minimum of one error—this could include evidence of brush marks, small areas that were not fully colorized, or incorrect blending modes.

Projects at the Emerging Proficiency level include a minimum of two errors—these are the same as outlined above. Projects at this level still demonstrate a solid command of the relevant concepts & techniques.

Projects at the Lacks Demonstrated Proficiency level include a minimum of three significant errors that detract substantially from the result. The student typically has not mastered the relevant tools/techniques and has not invested enough time in executing the project.

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Assessment Reporting

Threshold Achievement

Has the threshold been met?

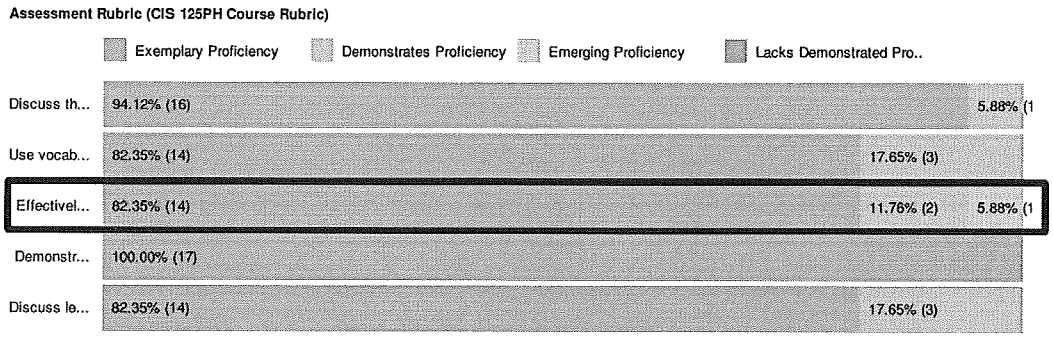
Green 85% or higher Yellow 75%-84% Red >74%

○ Not Met ○ Met ◉ Exceeded

Substantiating Evidence

What evidence supports the findings?

Chart from assessment reporting VIA software.



Element	Exemplary Proficiency	Demonstrates Proficiency	Emerging Proficiency	Lacks Demonstrated Proficiency	Mean	Stdev
Discuss the design development process as it relates to the use of the subject software product	16	1	0	0	3.94	0.24
Use vocabulary of digital design and associated applications.	14	3	0	0	3.82	0.39
Effectively apply appropriate beginning and intermediate software techniques for given digital design challenges.	14	2	1	0	3.76	0.56
Demonstrate proper file management.	17	0	0	0	4.00	0.00
Discuss legal, ethical, and accessibility issues in a digital design.	14	3	0	0	3.82	0.39

Chemistry

Outcome 1	Measureable Criteria	Measurement Tool	Courses	Time Frame
Utilize knowledge of **chemical structure** to predict and explain the physical properties of chemical materials.	An average score of at least 80% or better on homework and 70% or better on homework and exam questions relating to **chemical structure**.	Homework, Exams	CHEM 110 CHEM 221 CHEM 222 CHEM 223	Data collection begins: 2015-2016 Analysis begins: 2016-2017

2015-2016 Results:

CHEM 221 – FL15	Average		Average		Average
HW Chp. 1	N/A	**HW Chp. 7**	87%	**Exam 1**	79%
HW Chp. 2	96%	**HW Chp. 8**	93%	**Exam 2**	70%
HW Chp. 3	N/A	**HW Chp. 9**	86%	**Final Exam**	
HW Chp. 4	N/A	**HW Chp. 10**	90%		

CHEM 110 – FL15	Average		Average		Average
HW Chp. 2	91%	**HW Chp. 8**	79%	**Exam 1**	80%
HW Chp. 3	97%	**HW Chp. 17**		**Exam 2**	57% (n=1)
HW Chp. 5	84%	**HW Chp. 19**		**Final Exam**	
HW Chp. 6	N/A	**HW Chp. 21**			

Analysis:

CHEM 221
Homework: 90%, Exams: 75%

CHEM 110
Homework: 88%, Exams: 69%

Plan:
I will continue to examine my teaching methodologies and exam and homework questions to improve these numbers.

Further, although students have met my standards, it is difficult to know whether they have met national standards. To compare student achievement in my courses to student achievement in General Chemistry courses nation-wide, I plan to administer an American Chemical Society approved exam for general chemistry at the conclusion of CHEM 223.

Outcome 1	Measureable Criteria	Measurement Tool	Courses	Time Frame
Utilize knowledge of **chemical structure** to predict	**CHEM 110/GS 105/CHEM 221:** at least 75% achieve "emerging proficiency"	Homework, Exams,	GS 105 CHEM 110 CHEM 221	Data collection begins: WT17

and explain the physical properties of chemical materials.	**CHEM 222:** at least 75% achieve "marginal proficiency" **CHEM 223:** at least 75% achieve "developed proficiency" **CHEM 245/246/247:** at least 75% achieve "exemplary proficiency"	Chemical structure rubric	CHEM 222 CHEM 223 CHEM 245 CHEM 246 CHEM 247	Analysis begins: SP17

2016-2017 winter Results:

CHEM 246 GOAL:	WT17 RESULTS:
At least 75% of students achieve at least "exemplary proficiency"	**100%** of students achieved at least "exemplary proficiency"

Exemplary Proficiency | Developed Proficiency | Marginal Profiency | Emerging Proficiency | Lacks Demon Proficie

WINTER 2017 **CHEM 110**

Rubric View: Chemical Structure Rubric

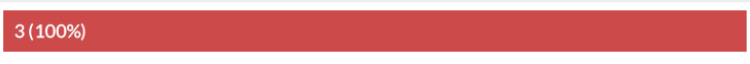
	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Profiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Electronic Structure	0	0	21	0	2	1.826	2.000	0.564
Molecular Geometry	0	0	0	20	3	0.870	1.000	0.337
Spectroscopic Analysis	0	0	0	0	0	0.000	NA	0.000

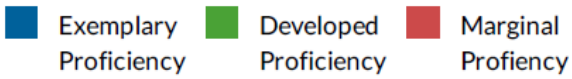
Spectroscopic Analysis
std_text

CHEM 110 GOAL:	WT
At least 75% of students achieve at least "emerging proficiency"	**88.** ach "er

Rubric View: Chemical Structure Rubric **CHEM 246**

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Profiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Electronic Structure	3	0	0	0	0	4.000	4.000	0.000
Molecular Geometry	3	0	0	0	0	4.000	4.000	0.000
Spectroscopic Analysis	0	0	3	0	0	2.000	2.000	0.000





Rubric View: Chemical Structure Rubric **GS 105**

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Profiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Electronic Structure	0	17	2	0	0	2.895	3.000	0.307
Molecular Geometry	0	0	17	2	0	1.895	2.000	0.307
Spectroscopic Analysis	0	0	0	0	0	0.000	NA	0.000

Electronic Structure
std_text

Molecular Geometry
std_text

Spectroscopic Analysis
std_text

RESULTS: 100% of students in both CHEM 246 and GS 105 achieved the desired level of performance in the categories of chemical structure. 88.5% of students in CHEM 110 achieved the desired level of performance with regards to chemical structure.

ANALYSIS: Although a majority of students scored at the desired level of performance in this exercise, I believe that there is more work to be done. I do believe that these data reflect the true abilities of my students in this category, as I have been sufficiently impressed with their understanding of chemical structure. However, the data seem to indicate that nearly all of the students in the course are achieving at the same level; I do not necessarily believe this result. I think that the problem lies within the chemical structure rubric; if it were designed more carefully, it could be used to investigate these differences in abilities between students in the same course, even if they are achieving at the desired performance level.

PLAN: This initial assessment is promising, but I believe that students can perform even better in this area. I will take another look at the "chemical structure rubric" to see if I can change the wording of each category to better match student performance and to better tease out small differences in performance among students in the same course. Another possibility is to increase the measurable criteria for this outcome; rather than expecting 75% to perform better than "marginal proficiency", perhaps I should expect 75% to perform at or better than "developed proficiency".

ETS HElghten

INSTITUTIONAL SCORE REPORT

REPORT DATE: 11/16/2017

Southwestern Oregon Community College

Coos Bay, OR
USA
Test: **HElghten® Critical Thinking Assessment**

REPORTING GROUP:

Cohort: Combined
Close Date: Combined
Students Tested: 46
Records Excluded: 1
Students Included in Report: 45
(See bottom of report to view filters applied)

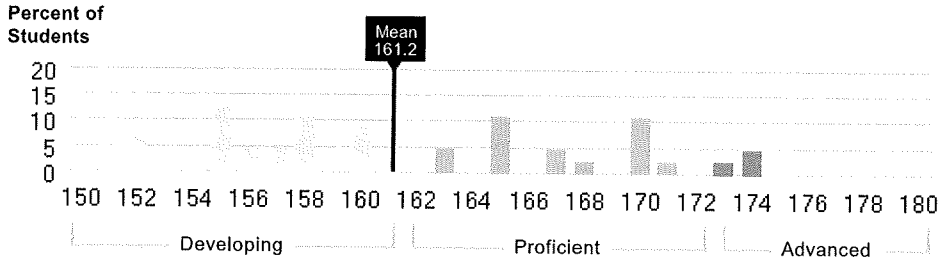
COMPARISON GROUP:

Comparison Group: All Institutions
Institutions: 29
Students Included in Report: 2,520

INDIVIDUAL STUDENTS' OVERALL SCALED SCORES

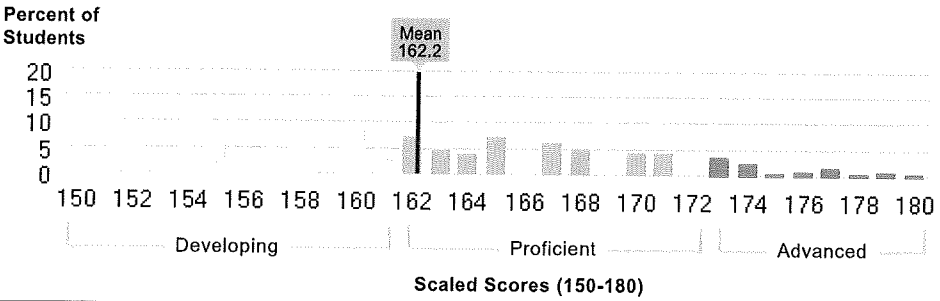
The histograms below show the distribution of individual students' scaled scores within the Reporting Group and the Comparison Group. The dark line indicates the overall mean score for that group.

REPORTING GROUP



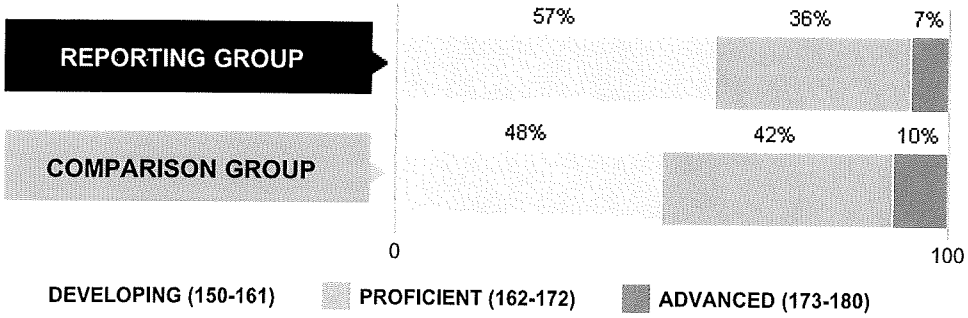
Different students take different forms of this test. On each form, some numbers in the score range are not possible scores. Consequently, the score distributions are not smooth, even for large groups of students.

COMPARISON GROUP



PROFICIENCY LEVELS

This chart shows the percentage of students at each proficiency level within the Reporting Group and the Comparison Group.



PROFICIENCY LEVEL DESCRIPTIONS

DEVELOPING (150-161)

A typical student at the **developing** level may:

- make inferential connections between two explicitly related points
- follow the logic of an explicitly structured argument
- mistake evidence that is broadly related to a topic for evidence that is relevant to a specific assertion
- identify evidence that directly supports or undermines a claim
- have difficulty distinguishing causation from correlation

PROFICIENT (162-172)

A typical student at the **proficient** level has demonstrated the ability to:

- make inferential connections
- follow the logic of an argument
- understand logical relationships between assertions/arguments and supporting information
- identify implicit assumptions and evidence that supports or undermines a claim
- distinguish causation from correlation

ADVANCED (173-180)

A typical student at the **advanced** level has demonstrated the ability to:

- extrapolate implications
- describe the logic of complex arguments
- understand subtle logical relationships between assertions/arguments and supporting information
- identify needed evidence and implicit assumptions
- identify possible alternative causes or explanations

See www.ets.org/heighten/ctproficiency for the complete descriptions.

Report Filters
Major: All | Class Level (Credit Hours): All

Report excludes students who complete fewer than 75% of the questions. See roster for list of students.
For more information about your score report, please go to http://www.ets.org/heighten/scores. For additional resources go to http://www.ets.org/heighten.

Southwestern Oregon Community College

Coos Bay, OR
USA
Test: **HElghten® Critical Thinking Assessment**

REPORTING GROUP:

Cohort: Combined
Close Date: Combined
Students Tested: 46
Records Excluded: 1
Students Included in Report: 45
(See bottom of report to view filters applied)

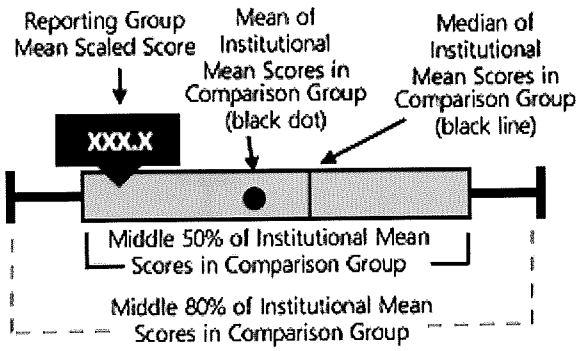
COMPARISON GROUP:

Comparison Group: All Institutions
Institutions: 29
Students Included in Report: 2,520

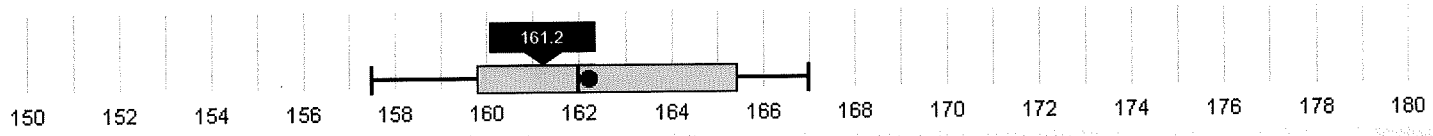
INSTITUTIONS' OVERALL SCALED SCORE AND SUBSCORE MEANS

The chart below enables you to compare the mean scaled scores for your Reporting Group with the mean scaled scores of the institutions in the Comparison Group.

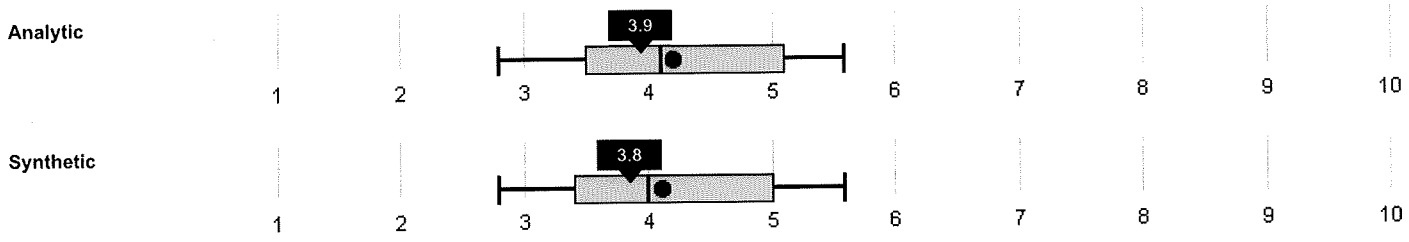
The number in the dark rectangle is the mean scaled score of your Reporting Group. The figure below it is a "box-and-whisker" graph of the mean scores of the institutions in the Comparison Group. The yellow bar (the "box") shows the range of the middle 50% of the institutions. The black horizontal lines (the "whiskers") extend to the range of the middle 80%. The vertical line through the box indicates the median – the point that separates the upper half of the institutions from the lower half. The black dot indicates the mean of the institutions' mean scores.



OVERALL SCALED SCORES (Scale of 150-180)



SUBSCORES (Scale of 1-10)



Report Filters
Major: All | Class Level (Credit Hours): All

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For more information about your score report, please go to http://www.ets.org/heighten/scores. For additional resources go to http://www.ets.org/heighten.

ETS HEIghten

INSTITUTIONAL SCORE REPORT

REPORT DATE: 11/16/2017

Southwestern Oregon Community College

Coos Bay, OR
USA
Test: **HEIghten® Quantitative Literacy Assessment**

REPORTING GROUP:

Cohort: Combined
Close Date: Combined
Students Tested: 43
Records Excluded: 1
Students Included in Report: 42
(See bottom of report to view filters applied)

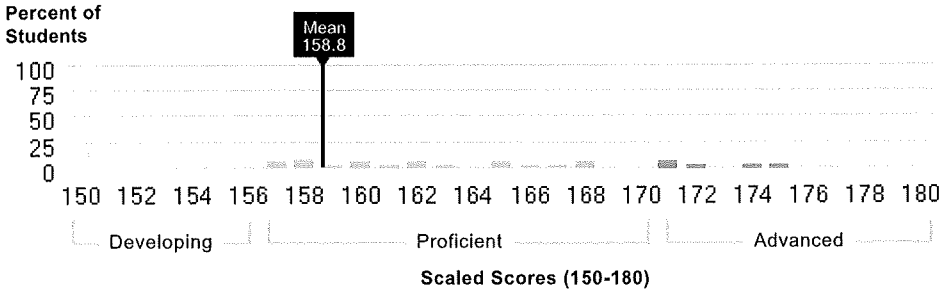
COMPARISON GROUP:

Comparison Group: All Institutions
Institutions: 12
Students Included in Report: 822

INDIVIDUAL STUDENTS' OVERALL SCALED SCORES

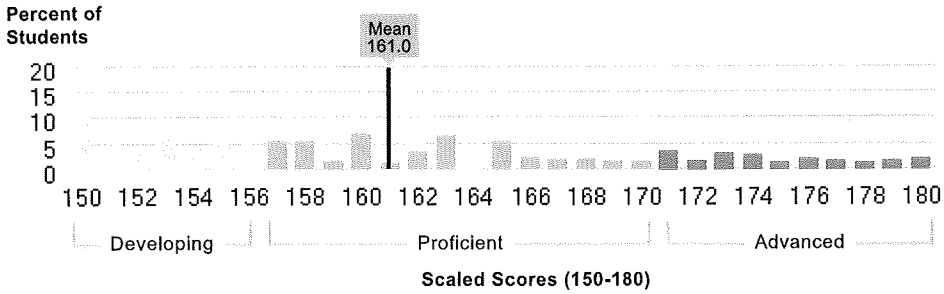
The histograms below show the distribution of individual students' scaled scores within the Reporting Group and the Comparison Group. The dark line indicates the overall mean score for that group.

REPORTING GROUP



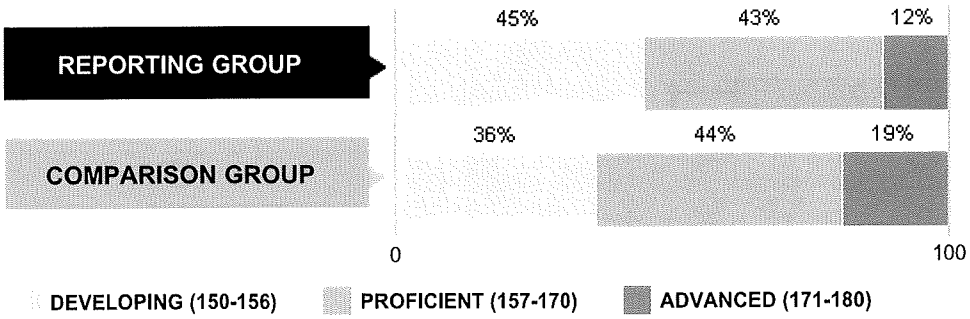
Different students take different forms of this test. On each form, some numbers in the score range are not possible scores. Consequently, the score distributions are not smooth, even for large groups of students.

COMPARISON GROUP



PROFICIENCY LEVELS

This chart shows the percentage of students at each proficiency level within the Reporting Group and the Comparison Group.



PROFICIENCY LEVEL DESCRIPTIONS

DEVELOPING (150-156)

A typical student at the **developing** level may:

- reason through single-step word problems
- recognize basic algebraic techniques and Euclidean geometry facts
- perform four basic operations with integers
- interpret simple quantitative relationships
- identify that terminology/notation are needed to communicate results

PROFICIENT (157-170)

A typical student at the **proficient** level has demonstrated the ability to:

- reason through simple multi-step word problems
- apply solution strategies to a particular context
- use basic algebra and Euclidean geometry facts
- compute basic percents and positive percent change
- perform the four basic operations with integers and decimals
- interpret simple quantitative relationships and some complex data representations
- recognize correct terminology/notation for communicating results

ADVANCED (171-180)

A typical student at the **advanced** level has demonstrated the ability to:

- reason through complex multi-step word problems
- apply solution strategies to a variety of contexts
- use and understand algebra and Euclidean geometry facts
- compute and interpret percents and percent change
- perform four basic operations with integers, decimals, and fractions
- interpret complex quantitative relationships and data representations
- use correct terminology/notation for communicating results

See www.ets.org/heighten/qlproficiency for the complete descriptions.

Report Filters
Major: All | Class Level (Credit Hours): All

Report excludes students who complete fewer than 75% of the questions. See roster for list of students.
For more information about your score report, please go to http://www.ets.org/heighten/scores. For additional resources go to http://www.ets.org/heighten.

Southwestern Oregon Community College

Coos Bay, OR
USA
Test: **HElghten® Quantitative Literacy Assessment**

REPORTING GROUP:

Cohort: Combined
Close Date: Combined
Students Tested: 43
Records Excluded: 1
Students Included in Report: 42
(See bottom of report to view filters applied)

COMPARISON GROUP:

Comparison Group: All Institutions
Institutions: 12
Students Included in Report: 822

INSTITUTIONS' OVERALL SCALED SCORE AND SUBSCORE MEANS

The chart below enables you to compare the mean scaled scores for your Reporting Group with the mean scaled scores of the institutions in the Comparison Group.

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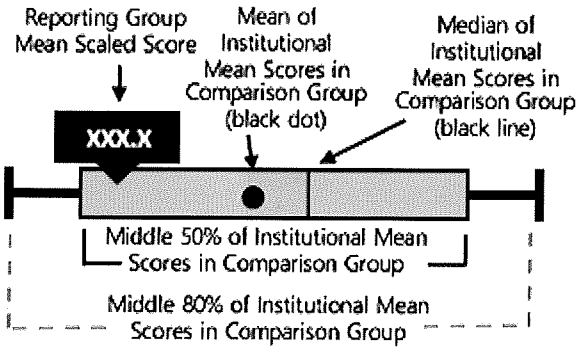
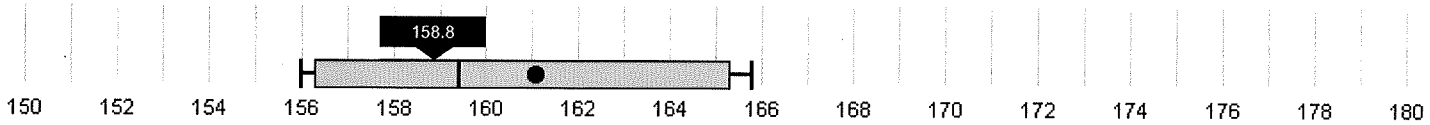
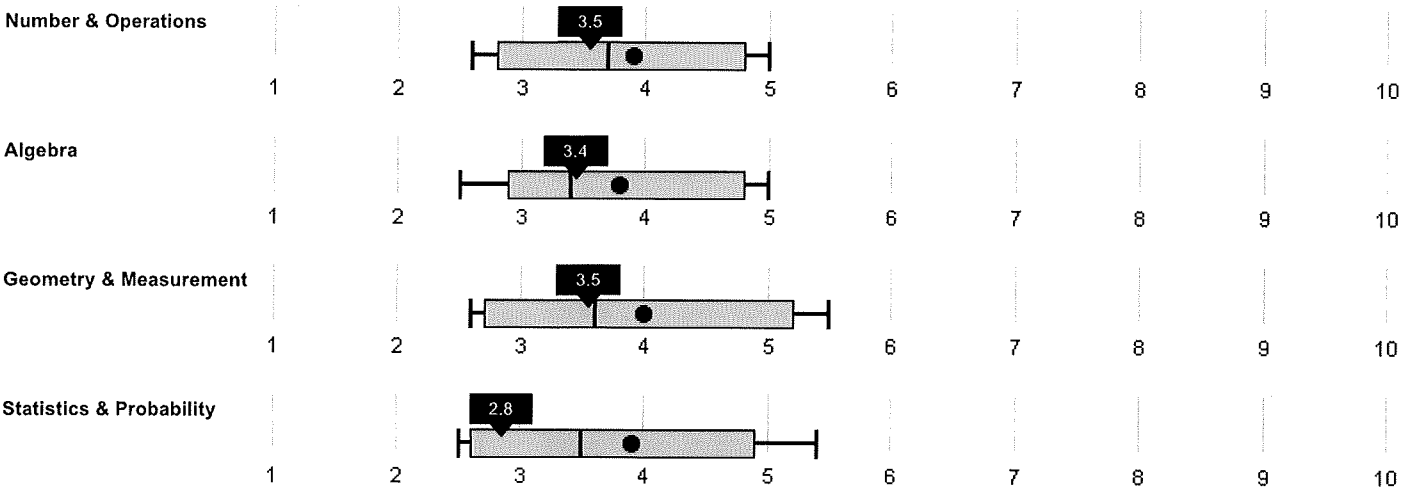


OVERALL SCALED SCORES (Scale of 150-180)



SUBSCORES (Scale of 1-10)



Report Filters
Major: All | Class Level (Credit Hours): All

Report excludes students who complete fewer than 75% of the questions. See roster for list of students.
For more information about your score report, please go to **http://www.ets.org/heighten/scores**. For additional resources go to **http://www.ets.org/heighten**.

ETS HElghten

INSTITUTIONAL SCORE REPORT

REPORT DATE: 11/16/2017

Southwestern Oregon Community College

Coos Bay, OR
USA
Test: **HElghten® Written Communication Assessment**

REPORTING GROUP:

Cohort: Combined
Close Date: Combined
Students Tested: 44
Records Excluded: 3
Students Included in Report: 41
(See bottom of report to view filters applied)

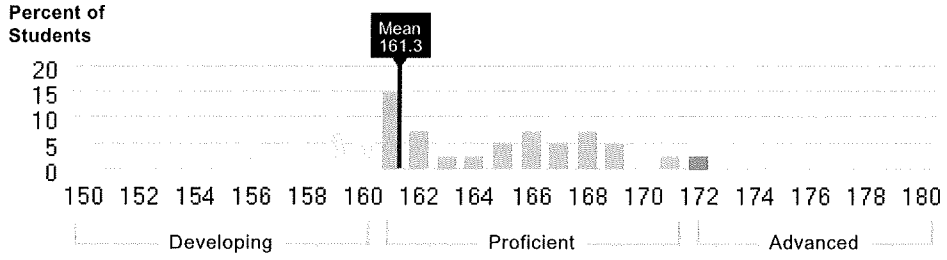
COMPARISON GROUP:

Comparison Group: All Institutions
Institutions: 27
Students Included in Report: 2,162

INDIVIDUAL STUDENTS' OVERALL SCALED SCORES

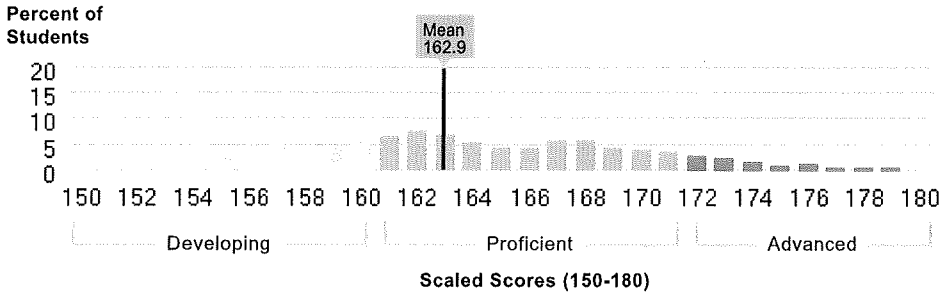
The histograms below show the distribution of individual students' scaled scores within the Reporting Group and the Comparison Group. The dark line indicates the overall mean score for that group.

REPORTING GROUP



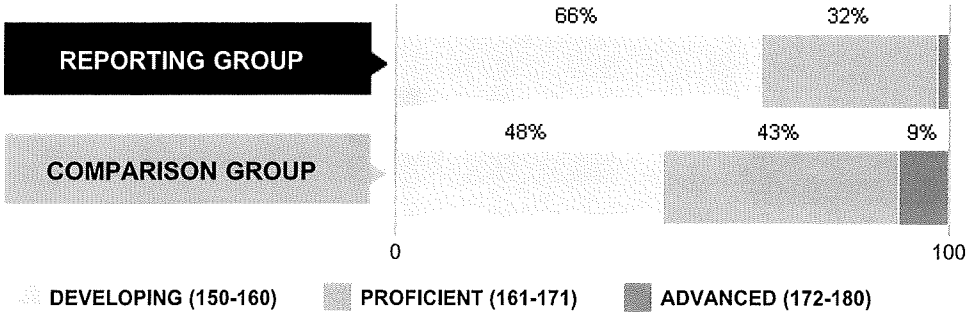
Different students take different forms of this test. On each form, some numbers in the score range are not possible scores. Consequently, the score distributions are not smooth, even for large groups of students.

COMPARISON GROUP



PROFICIENCY LEVELS

This chart shows the percentage of students at each proficiency level within the Reporting Group and the Comparison Group.



When a reporting group proficiency level is less than 6%, the percent value will not display. If the proficiency level information cannot be determined using the chart, administrators may calculate the percentages using the data download report.

PROFICIENCY LEVEL DESCRIPTIONS

DEVELOPING (150-160)

A typical student at the **developing** level may:

- not consistently use or recognize the use of appropriate information from source texts
- be unable to represent a source's meaning with accuracy
- have difficulty developing ideas or recognizing the development of ideas
- struggle to present ideas or recognize the presentation of ideas
- have difficulty composing or revising text to be generally free of errors

PROFICIENT * (161-171)

A typical student at the **proficient** level has demonstrated the ability to:

- use or recognize the use of appropriate information from source texts
- represent a source's meaning with general accuracy
- develop ideas or recognize the development of ideas
- present ideas or recognize the presentation of ideas
- compose or revise text to be generally free of errors

ADVANCED * (172-180)

A typical student at the **advanced** level has demonstrated the ability to:

- use or recognize the use of appropriate information from source texts to convincingly support ideas
- represent a source's meaning with accuracy
- fully develop ideas or recognize the full development of ideas
- effectively present ideas or recognize the effective presentation of ideas
- compose or revise text to be free of all but minor errors

*To qualify as Proficient or Advanced, test takers must also earn a minimum essay score of 6.

See **www.ets.org/heighten/wcproficiency** for the complete descriptions.

Report Filters
Major: All | Class Level (Credit Hours): All

Report excludes students who complete fewer than 75% of the questions. See roster for list of students.
For more information about your score report, please go to **http://www.ets.org/heighten/scores**. For additional resources go to **http://www.ets.org/heighten**.

Southwestern Oregon Community College

Coos Bay, OR
USA
Test: **HEIghten® Written Communication Assessment**

REPORTING GROUP:

Cohort: Combined
Close Date: Combined
Students Tested: 44
Records Excluded: 3
Students Included in Report: 41
(See bottom of report to view filters applied)

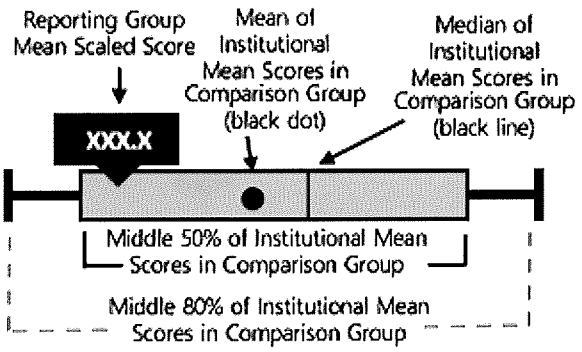
COMPARISON GROUP:

Comparison Group: All Institutions
Institutions: 27
Students Included in Report: 2,162

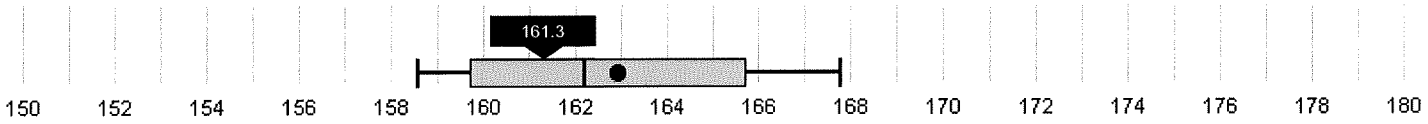
INSTITUTIONS' OVERALL SCALED SCORE AND SUBSCORE MEANS

The chart below enables you to compare the mean scaled scores for your Reporting Group with the mean scaled scores of the institutions in the Comparison Group.

The number in the dark rectangle is the mean scaled score of your Reporting Group. The figure below it is a "box-and-whisker" graph of the mean scores of the institutions in the Comparison Group. The yellow bar (the "box") shows the range of the middle 50% of the institutions. The black horizontal lines (the "whiskers") extend to the range of the middle 80%. The vertical line through the box indicates the median – the point that separates the upper half of the institutions from the lower half. The black dot indicates the mean of the institutions' mean scores.

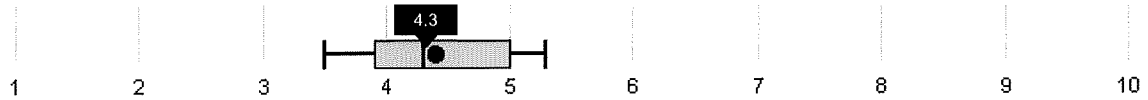


OVERALL SCALED SCORES (Scale of 150-180)

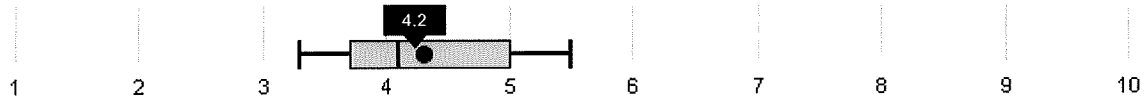


SUBSCORES (Scale of 1-10)

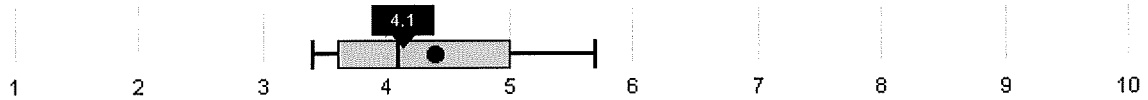
Knowledge of Social and Rhetorical Situations



Knowledge of Conceptual Strategies



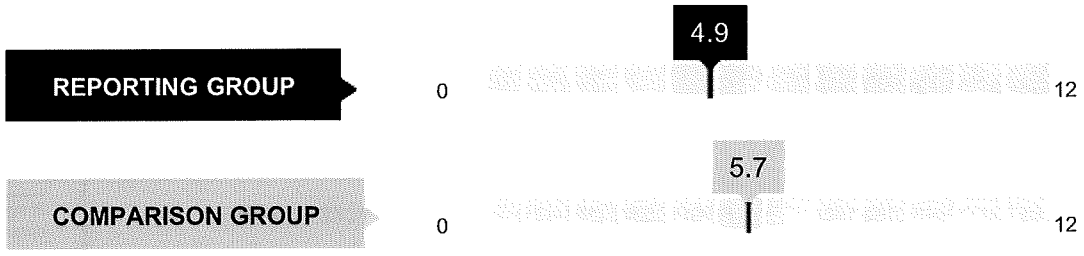
Knowledge of Language Use and Conventions



DIRECT WRITING MEASURE (Scale of 0-12)

The Direct Writing Measure requires students to compose an original response that adopts and defends a position on the claim presented in a passage.

To see the scoring rubric for the Direct Writing Measure, please go to: **www.ets.org/heighten/scores**.



Report Filters
Major: All | Class Level (Credit Hours): All

Report excludes students who complete fewer than 75% of the questions. See roster for list of students.
For more information about your score report, please go to **http://www.ets.org/heighten/scores**. For additional resources go to **http://www.ets.org/heighten**.

APPENDIX B

COMMUNICATION
GENERAL STUDENT LEARNING OUTCOMES RUBRIC

for more information, please contact value@aacu.org

Definition

Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Exemplary Proficiency 4	**Marginal Proficiency** **3**	**Emerging Proficiency** **2**	**Lacks Demonstrated Proficiency** 1
Control of Syntax and Mechanics	Uses graceful language skillfully, communicates meaning to readers with clarity and fluency, and is virtually error-free.	Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.	Uses language that generally conveys meaning to readers with clarity, although the writing may include some errors.	Uses language that sometimes impedes meaning because of errors in usage.
Comprehension	Recognizes possible implications of the source communication for contexts, perspectives, or issues beyond the assigned task within the classroom or beyond the speaker's or author's explicit message (e.g., might recognize broader issues at play or might pose challenges to the presenter's message and presentation.)	Uses the source, text, general background knowledge, and/or specific knowledge of the speaker's or author's context to draw more complex inferences about the presenter's message and attitude.	Evaluates how language features (e.g., sentence and paragraph structure or tone) contribute to the speaker's or author's message and draws basic inferences about context and purpose of oral or written language.	Apprehends vocabulary appropriately to paraphrase or summarize the information the text communicates.
Supporting Material	Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre. Uses a variety of types of supporting material and presents appropriate references and analysis that establish the presenter's credibility on the topic. Always correctly credits the source of ideas not the student's own.	Demonstrates consistent use of credible, relevant sources to support ideas within the discipline and genre in oral or written communication.	Demonstrates an attempt to use credible and/or relevant sources that partially support ideas appropriately.	Demonstrates an attempt to use sources to support ideas, but produces insufficient supporting materials such as explanations, examples, illustrations, statistics, analogies, and quotations. Makes reference to information or analysis that minimally support the presentation or establish the student's authority on the topic.
Analysis: *Interacting with texts in parts and as wholes*	Evaluates strategies for relating ideas, text structure, or other textual features in order to build knowledge or insight within and across texts and disciplines.	Identifies relations among ideas, text structure, or other textual features, to evaluate how they support an advanced understanding of the text as a whole.	Recognizes relations among parts or aspects of a text, such as effective or ineffective arguments or literacy features, in considering how these contribute to a basic understanding of the text as a whole.	Identifies aspects of a text (e.g., content, structure, or relations among ideas) as needed to respond to questions posed in assigned tasks.

COMPUTATION
GENERAL STUDENT LEARNING OUTCOMES RUBRIC

for more information, please contact value@aacu.org

Association of American Colleges and Universities

Definition

Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Exemplary Proficiency 4	**Marginal Proficiency 3**	**Emerging Proficiency 2**	**Lacks Demonstrated Proficiency 1**
Application / Analysis *Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis*	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from this work.	Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.
Communication *Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)*	Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality.	Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explication may be uneven.	Uses quantitative information, but does not effectively connect it to the argument or purpose of the work.	Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (May use quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.)
Connections to Discipline *Sees (makes) connections across disciplines. perspectives*	Independently creates wholes out of multiple parts (synthesizes) or draws conclusions by combining examples, facts, or theories from more than one field of study or perspective.	Independently connects examples, facts, or theories from more than one field of study or perspective.	When prompted, connects examples, facts, or theories from more than one field of study or perspective.	When prompted, presents examples, facts, or theories from more than one field of study or perspective.
Transfer *Adapts and applies skills, abilities, theories, or methodologies gained in one situation to new situations*	Adapts and applies, independently, skills, abilities, theories, or methodologies gained in one situation to new situations to solve difficult problems or explore complex issues in original ways.	Adapts and applies skills, abilities, theories, or methodologies gained in one situation to new situations to solve problems or explore issues.	Uses skills, abilities, theories, or methodologies gained in one situation in a new situation to contribute to understanding of problems or issues.	Uses, in a basic way, skills, abilities, theories, or methodologies gained in one situation in a new situation.
Define Problem	Demonstrates the ability to construct a clear and insightful problem statement with evidence of all relevant contextual factors	Demonstrates the ability to construct a problem statement with evidence of most relevant contextual factors, and problem statement is adequately detailed.	Begins to demonstrate the ability to construct a problem statement with evidence of most relevant contextual factors, but problem statement is superficial	Demonstrates a limited ability in identifying a problem statement or related contextual factors.

Propose Solutions/Hypotheses	Proposes one or more solutions/hypotheses that indicates a deep comprehension of the problem. Solution/hypotheses are sensitive to contextual factors as well as all of the following: ethical, logical, and cultural dimensions of the problem.	Proposes one or more solutions/ hypotheses that indicates comprehension of the problem. Solutions/hypotheses are sensitive to contextual factors as well as the one of the following: ethical, logical, or cultural dimensions of the problem.	Proposes one solution/hypothesis that is "off the shelf " rather than individually designed to address the specific contextual factors of the problem.	Proposes a solution/hypothesis that is difficult to evaluate because it is vague or only indirectly addresses the problem statement.
Implement Solution	Implements the solution in a manner that addresses thoroughly and deeply multiple contextual factors of the problem.	Implements the solution in a manner that addresses multiple contextual factors of the problem in a surface manner.	Implements the solution in a manner that addresses the problem statement but ignores relevant contextual factors.	Implements the solution in a manner that does not directly address the problem statement.

CREATIVE, CRITICAL & ANALYTICAL THINKING
GENERAL STUDENT LEARNING OUTCOMES RUBRIC

for more information, please contact value@aacu.org

Association of American Colleges and Universities

Definition

Students completing a degree will be able to demonstrate effective knowledge, skills and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Exemplary Proficiency 4	**Marginal Proficiency 3**	**Emerging Proficiency 2**	**Lacks Demonstrated Proficiency 1**
Identifies and explains 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 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.	Issue or problem is not stated clearly even when explicitly required.
Recognizes contexts and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of 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). Begins to identify some contexts when presenting a position.	Appears unaware of varying contexts and assumptions for an issue.
Recognizes perspectives	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 (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.	Specific position is vague and/or does not recognize multiple perspectives even when there are signs that they are present.
Evaluates evidence to reach conclusions	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 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.	Conclusion is not reached or has little bearing on the actual issue.

Southwestern Oregon Community College General Student Learning Outcomes for **Creating, Critical & Analytical Thinking** are based on VALUE Rubrics in Critical Thinking, Creative Thinking, Information Literacy, and Inquiry and Analysis

COMMUNITY/GLOBAL CONSCIOUSNESS & RESPONSIBILITY GENERAL STUDENT LEARNING OUTCOMES RUBRIC

for more information, please contact value@aacu.org

Association of American Colleges and Universities

Definition

Students completing a degree will be able to demonstrate effective knowledge, skills and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Exemplary Proficiency 4	**Marginal Proficiency 3**	**Emerging Proficiency 2**	**Lacks Demonstrated Proficiency 1**
Interpersonal skills, respect, integrity, empathy	Supports a constructive team climate by doing four (4) of the criteria:	Supports a constructive team climate by doing three (3) of the criteria:	Supports a constructive team climate by doing two (2) of the criteria:	Supports a constructive team climate by doing one (1) of the criteria:
	• Treats team members respectfully by being polite and constructive in communication. • Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. • Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. • Provides assistance and/or encouragement to team members.			
Ethical Self-Awareness	Student discusses in detail/analyzes both core beliefs and the origins of the core beliefs.	Student discusses in detail both core beliefs and the origins of the core beliefs.	Student states core beliefs and origins of the core beliefs	Student either states core beliefs or articulates the origins of the core beliefs, but not both.
Self-esteem	Effectively addresses significant issues in the natural and human world based on articulating one's identity in a global context.	Evaluates the global impact on one's own and others' specific local actions on the natural and human world	Analyzes ways that human actions influence the natural and human world	Identifies some connections between an individual's personal decision-making and certain local and global issues.
Citizenship, community service	Provides evidence of experience in civic-engagement activities and describes what she/he has learned about her or himself as it relates to a reinforced and clarified sense of civic identity and continued commitment to public action.	Provides evidence of experience in civic-engagement activities and describes what she/he has learned about her or himself as it relates to a growing sense of civic identity and commitment.	Evidence suggests involvement in civic-engagement activities is generated from expectations or course requirements rather than from a sense of civic identity.	Provides little evidence of her/his experience in civic-engagement activities and does not connect experiences to civic identity.
Cultural awareness	Demonstrates evidence of adjustment in own attitudes and beliefs because of working within and learning from diversity of communities and cultures. Promotes others' engagement with diversity.	Reflects on how own attitudes and beliefs are different from those of other cultures and communities. Exhibits curiosity about what can be learned from diversity of communities and cultures.	Has awareness that own attitudes and beliefs are different from those of other cultures and communities. Exhibits little curiosity about what can be learned from diversity of communities and cultures.	Expresses attitudes and beliefs as an individual, from a one-sided view. Is indifferent or resistant to what can be learned from diversity of communities and cultures.

Lifelong learning	Reviews prior learning (past experiences inside and outside of the classroom) in depth to reveal significantly changed perspectives about educational and life experiences, which provide foundation for expanded knowledge, growth, and maturity over time.	Reviews prior learning (past experiences inside and outside of the classroom) in depth, revealing fully clarified meanings or indicating broader perspectives about educational or life events.	Reviews prior learning (past experiences inside and outside of the classroom) with some depth, revealing slightly clarified meanings or indicating a somewhat broader perspectives about educational or life events.	Reviews prior learning (past experiences inside and outside of the classroom) at a surface level, without revealing clarified meaning or indicating a broader perspective about educational or life events.

Southwestern Oregon Community College General Student Learning Outcomes for **Community/Global Student learning Outcomes** are based on VALUE Rubrics in Civic Engagement, Intercultural Knowledge and Competence, Global Learning, Ethical Reasoning, and Foundations and Skills for Lifelong Learning

SOUTHWESTERN OREGON COMMUNITY COLLEGE

SWOCC Outcomes Assessment Maps

Associate of Arts/Oregon Transfer (AA/OT)

AA/OT Requirements	AA/OT GE Outcomes	Institutional General Student Learning Outcomes
Foundational Requirements All courses must be completed with a grade of 'C' or better		
Writing WR Three (3) courses from WR121, WR122, WR 123, or WR227 Note: Information Literacy is included through embedding the appropriate content in courses that count toward the writing Foundational Requirement.	1. Read actively, think critically, and write purposefully and capably for academic and, in some cases, professional audiences. 2. Locate, evaluate, and ethically utilize information to communicate effectively. 3. Demonstrate appropriate reasoning in response to complex issues.	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. WR2 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. WR1 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. WR3
Information Literacy IL Information Literacy is included through embedding the appropriate content in courses that count toward the writing Foundational Requirement.	1. Formulate a problem statement. 2. Determine the nature and extent of the information needed to address the problem. 3. Access relevant information effectively and efficiently. 4. Evaluate information and its source critically. 5. Understand many of the economic, legal and social issues surrounding the use of information.	• **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. IL1, IL2, IL3, IL4 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. IL5

SOUTHWESTERN OREGON COMMUNITY COLLEGE

SWOCC Outcomes Assessment Maps

Communication COMM One (1) course form SP100, SP111, SP218, or SP219	1. Engage in ethical communication processes that accomplish goals. 2. Respond to the needs of diverse audiences and contexts. 3. Build and manage relationships.	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. COMM1, COMM2, COMM3 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. COMM1, COMM2, COMM3 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. COMM1, COMM2, COMM3
Mathematics MTH One (1) course from: MTH105 with a prerequisite of MTH 98 or MTH111 or higher with a prerequisite of MTH 95, excluding MTH 211	1. Use appropriate mathematics to solve problems. 2. Recognize which mathematical concepts are applicable to a scenario, apply appropriate mathematics and technology in its analysis, and then accurately interpret, validate, and communicate the results.	• **Computation.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data. MTH1, MTH2 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. MTH1, MTH2
Health, Wellness and Fitness HE PE185 (3 courses) or one (1) three credit course from HE250 or PE231	1. Evaluate and assess physical fitness needs. 2. Create an effective physical training program. 3. Evaluate how well a physical training program works and how to make adjustments to improve it. 4. Understand strength, flexibility, speed and power.	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. HE1, HE2 • **Computation.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data. HE1, HE2, HE3, HE4 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. HE1, HE2, HE3, HE4 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. HE2, HE3

SOUTHWESTERN OREGON COMMUNITY COLLEGE

SWOCC Outcomes Assessment Maps

Discipline Studies Requirements All courses must be completed with a grade of 'C' or better.		
Arts and Letters. AL Three (3) courses chosen from two (2) or more disciplines. Note: A second year foreign language may be included, but not first year.	1. Interpret and engage in the Arts and Letters, making use of the creative process to enrich the quality of life. 2. Critically analyze personal values and ethics within the stream of human experience and expression to engage more fully in local and global issues.	• **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. AL1 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. AL2
Social Science SS Four (4) courses chosen from two (2) or more disciplines	1. Apply analytical skills to social phenomena in order to understand human behavior. 2. Apply knowledge and experience to foster personal growth and better appreciate the diverse social world in which we live.	• **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. SS1 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. SS2
Science/Mathematics/Computer Science SCI Four (4) courses from at least two (2) disciplines including at least three (3) laboratory course in biological and/or physical science.	1. Gather, comprehend, and communicate scientific and technical information in order to explore ideas, models, and solutions and generate further questions. 2. Apply scientific and technical models of inquiry, individually and collaboratively, to critically evaluate existing or alternative explanations, solve problems, and make evidence-based decisions in an ethical manner. 3. Assess the strengths and weaknesses of scientific studies and critically examine the influence of scientific and technical knowledge on human society and the environment.	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. SCI1 • **Computation.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data. SCI3 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. SCI1 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. SCI2
Cultural Literacy CL Students must select one course from	Identify and analyze complex practices, values, and beliefs and the culturally and historically defined	• **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning,

any of the discipline studies that is designated as meeting the statewide criteria for cultural literacy.	meanings of difference.	community service, self-esteem, integrity, and empathy. CL1

SOUTHWESTERN OREGON COMMUNITY COLLEGE

SWOCC Outcomes Assessment Maps

Associate of General Science (AGS)

AGS Requirements	AGS GE Outcomes	Institutional General Student Learning Outcomes
Foundational Requirements All courses must be completed with a grade of 'C' or better		
Writing WR Two (2) courses at a level equivalent to the courses below: WR 121, 122. Note: Information Literacy is included through embedding the appropriate content in courses that count toward the writing Foundational Requirement.	• Read actively, think critically, and write purposefully and capably for academic and, in some cases, professional audiences. • Locate, evaluate, and ethically utilize information to communicate effectively. • Demonstrate appropriate reasoning in response to complex issues.	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. WR2 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. WR1 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. WR3
Communication COMM One (1) course form SP100, SP111, SP218, or SP219	• Engage in ethical communication processes that accomplish goals. • Respond to the needs of diverse audiences and contexts. • Build and manage relationships.	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. COMM1, COMM2, COMM3 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. COMM1, COMM2, COMM3 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. COMM1, COMM2, COMM3
Mathematics MTH One (1) course from: MTH105 with a prerequisite of MTH 98 or MTH111 or higher with a prerequisite of MTH 95, excluding MTH 211 Fundamentals of Elementary Mathematics I	• Use appropriate mathematics to solve problems. • Recognize which mathematical concepts are applicable to a scenario, apply appropriate mathematics and technology in its analysis, and then accurately interpret, validate, and communicate	• **Computation.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data. MTH1, MTH2 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research,

	the results.	and problem solving. MTH1, MTH2
Health, Wellness and Fitness HE Three (3) credits of PE 185 sport/activity or choose one (1) three-credit course form HE 250 Personal Health or PE 231 Wellness for Life.	• Evaluate and assess physical fitness needs. • Create an effective physical training program. • Evaluate how well a physical training program works and how to make adjustments to improve it. • Understand strength, flexibility, speed and power.	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. HE1, HE2 • **Computation.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data. HE1, HE2, HE3, HE4 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. HE1, HE2, HE3, HE4 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. HE2, HE3
Digital Literacy DL One (1) course from: CIS 120 CS 160 CS 161	• Discuss basic hardware and software concepts and demonstrate use of an operating system. • Demonstrate care, skill, and knowledge of contemporary office productivity software. • Discuss networks and the Internet, and their impact on Society.	• **Computation.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data. DL1, DL2 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. DL3 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. DL3

Discipline Studies Requirements All courses must be completed with a grade of 'C' or better.		
Arts and Letters. AL Three (3) courses from the approved distribution list. Note: A second year foreign language may be	• Interpret and engage in the Arts and Letters, making use of the creative process to enrich the quality of life. • Critically analyze personal values	• **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. AL1

included, but not first year.	and ethics within the stream of human experience and expression to engage more fully in local and global issues.	• **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. AL2
Social Science SS Three (3) courses from the approved distribution list.	• Apply analytical skills to social phenomena in order to understand human behavior. • Apply knowledge and experience to foster personal growth and better appreciate the diverse social world in which we live.	• **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. SS1 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. SS2
Science/Mathematics/Computer Science SCI Three (3) courses from the approved distribution list.	• Gather, comprehend, and communicate scientific and technical information in order to explore ideas, models, and solutions and generate further questions. • Apply scientific and technical models of inquiry, individually and collaboratively, to critically evaluate existing or alternative explanations, solve problems, and make evidence-based decisions in an ethical manner. • Assess the strengths and weaknesses of scientific studies and critically examine the influence of scientific and technical knowledge on human society and the environment.	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. SCI1 • **Computation.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data. SCI3 • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. SCI1 • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy. SCI2
Electives Students may take any college-level-course including Career and Technical Education courses without limitation that would bring total credits to 90 quarter hours.		

SOUTHWESTERN OREGON COMMUNITY COLLEGE

SWOCC Outcomes Assessment Maps

Related Instruction Outcomes

Requirements	AAS GE Outcomes	Institutional General Student Learning Outcomes
Related Instruction All courses must be completed with a grade of 'C' or better		
Communication	1. Engage in ethical communication processes that allow people to accomplish goals. 2. Respond to the needs of diverse audiences and contexts. 3. Build and manage personal and community relationships.	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. • **Computation.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data. • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy.
Computation	1. Analyze and evaluate real-world problems in a logical manner. 2. Model, analyze, and solve real-world problems in a mathematical context. 3. Utilize technology for analyzing and evaluating real-world problems.	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. • **Computation.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data. • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. • **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect,

		citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy.
Human Relations	1. Understand the importance of goal setting, planning, and the impact of a positive mental outlook in both one's personal and professional life. 2. Recognize and respect diversity as a vital component of effective human relation skills	• **Communication.** Students completing a degree will be able to demonstrate effective knowledge, skills, and attitudes in reading, writing, speaking, and listening, presentation of self and information. • **Computation.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes in technology skills, computer proficiency, math proficiency, decision analysis (synthesis & evaluation), understanding of and ability to apply mathematical concepts and reasoning, analyzing and using numerical data. • **Creative, Critical & Analytical Thinking.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes using curiosity, learning strategies, information gathering, analysis, synthesis, evaluation, creativity, research, and problem solving. **Community/Global Consciousness & Responsibility.** Students completing a degree will be able to demonstrate effective knowledge skills, and attitudes involving respect, citizenship, cultural awareness, interpersonal skills, ethics, lifelong learning, community service, self-esteem, integrity, and empathy.

2017

Physics Program Review

DR. AARON J. COYNER

SOUTHWESTERN OREGON COMMUNITY COLLEGE |

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Part A: Program Review Narratives

Program Description Goals/Philosophy

The physics discipline at Southwestern provides fundamental physics courses largely in fulfillment of the laboratory sciences components of the Associate of Arts Oregon Transfer and Associate of Science Oregon Transfer, ASOT-BUS, OTM, AS and AGS degrees offered at present by Southwestern. General science courses in physics (GS 104) and astronomy (GS 107) are included under the auspices of the physics program as lab sciences for non-STEM majors. The physics program also meets the following science student learning outcomes:

- Apply fundamental knowledge and models of a natural or physical science to analyze and/or predict phenomena.
- Understand the scientific method and apply scientific reasoning to critically evaluate arguments.
- Interpret and communicate scientific information via written, spoken, and/or visual representations.
- Describe the relevance of specific scientific principles to the human experience.
- Form and test a hypothesis in the laboratory or field using discipline-specific tools and techniques for data collection and/or analysis

In 2015, an initially part-time qualified physics faculty member was hired with the intention of revitalizing and building onto the existing physics program, particularly in light of the investment in the upcoming Health, Science , and Technology Building slated for completion in 2019. The program has moved forward with a philosophy to build it to a level of scholarly opportunity and achievement consistent with the first two years of a physics curriculum at a typical university. This includes not only the classes taught but the availability of outside research opportunities, additional student and community involvement and interactions. To that end, Southwestern has applied and been accepted as an affiliate member of the NASA Oregon Space Grant Consortium among other current projects.

Since 2015, we have expanded the physics program to offer the complete algebra-based and calculus-based sequences fundamental to transfer students in both physics and other STEM disciplines. Initially in 2015, only the PH 201 algebra-based physics first term was offered along with the full calculus based sequence. The PH 201 course was initially offered solely to meet

requirements for Forestry and Natural Resources transfer degrees; however, it has become apparent in recent years, that many other STEM or medical fields will accept algebra-based physics as a baseline for physics understanding needed for their respective programs. 2017-18 will be the first academic year since 2010 that both sequences will be allowed to run all three terms. 2016-17 saw the algebra-based sequence completed but as a reading and conference option (R and C) for students that required it for their transfer institutions.

The physics program at Southwestern is at a potential crossroads due to the investment in laboratory and classroom upgrades with the approval and construction of the new building. It is imperative that Southwestern as an institution continues to offer foundational courses in physics for students in all disciplines for years to come. We have the benefit at present of smaller class sizes and more individual student attention than students receive at the university level while still offering the rigor and challenge to prepare them for their transfer program aspirations. Continuing to offer these sequences along with additional physics and related courses provides our students with a firm foundation in further STEM studies. Consistency in the faculty and administrative support for these courses will also permit active recruiting for the physics and pre-engineering disciplines which could if properly implemented sustain the program well beyond the potential interest surge accompanying the new building

In addition to the courses offered, the physics program should facilitate research and learning opportunities beyond the classroom environment. Southwestern is not just a community college, but has enormous potential in students becoming active in STEM projects and collaborations to enhance the educational experience and the scientific skill set they transfer to their future endeavors. We foresee in the coming years, building a multi-disciplinary approach to STEM courses and collaborating both within the science faculty at Southwestern and beyond. Many programs are already in discussion:

- Collaboration with Dr. Springer, Dr. Brouse, and Dr. Kypriotakis on a potential multi-disciplinary living learning community cohort here at Southwestern led to valuable feedback from the NSF, and it is likely the proposal will be revised and resubmitted.
- Collaborations within OSGC facilitated through Dr. Jack Higginbotham at Oregon State University have provided the equipment to facilitate a high-altitude balloon team to conduct research into atmospheric and meteorological phenomena of the south coast.

Our intent is to collaborate with the existing balloon team at Oregon Coast Community College beginning in Winter 2018.

- Contact has been established with the PSAS at Portland State University to collaborate on portions of testing and development for their OreSat project.
- Discussion and collaboration spearheaded by Tasha Livingstone have begun to investigate offering courses or a beginning program in astrobiology.

It is the philosophy of this department that these opportunities should be fostered to benefit the long-term scientific development of our student population across disciplines. Additional projects may be forthcoming and will be discussed in more detail later in this review.

Administration

Faculty/Staffing:

Physics is currently staffed by a visiting instructor position as of the 2017-18 academic year. Dr. Aaron Coyner has served as physics faculty since September, 2015 first in part-time, then adjunct, and now visiting capacities. A full-time, tenure track position is warranted, and should be a critical priority for staffing the college going forward. The physics program plays a key role in Southwestern's involvement with the Oregon NASA Space Grant Consortium, and will be a key piece of the science department in the new building going forward. As such, facilitating and growing a competitive and sustainable physics program and curriculum requires a level of stability not seen at Southwestern since 2010 when the previous full-time physics instructor resigned. Going into a time when science at Southwestern will be at the forefront of much of the publicity at the college, it is in the best interest of the college to guarantee all of the science programs are on a stable foundation from which to grow. It is critical that the physics program hire a full-time tenure track faculty member to solidify the foundation and direction of the program.

The has been administrative discussion of reviving the pre-engineering sequence of courses and creating a path for interested engineering students to complete their pre-engineering core and prepare each of the students for the rigors of the engineering pro schools. To facilitate the new additions for pre-engineering, it is our contention that part time instructors (for the time being) should be considered to instruct either the general science courses or some of the pre-engineering requirements. This would allow the physics instructor to cover courses like statics, dynamics and mechanics of materials, courses that are largely physics intensive.

Professional Development:

Dr. Coyner attended the meeting of the American Astronomical Society's Solar Physics Division in August, 2017 in Portland in an attempt to stay current with research topics in his background of solar physics while also networking for potential student internships and/or research opportunities. In addition, Southwestern's involvement in the Oregon NASA Space Grant Consortium has facilitated a number of opportunities for networking and collaboration through the yearly affiliate meetings, research symposia, and collaborative projects.

Additionally, Dr. Coyner participated in the Leadership SWOCC cohort for the 2016-2017 academic year. This interaction has spawned opportunities for collaboration campus-wide. It has cemented the physics program as a part of the larger campus community.

Support Services Used:

Students within the physics program have been heavily involved in the tutoring services through the Laker Learning Commons on the Coos Bay campus. Many of the students serve as tutors for math and science course when not in class. Much of the class roster makes use of the tutoring center weekly for physics homework and exams. Beginning in Fall 2017, Title III grant funding was used to provide 3 1-hour long volunteer sessions per week of supplemental instruction with former physics student from 2016-17, Rand Black. These supplemental sessions have been reasonably well attended and from anecdotal reports very helpful to those students who have used them.

Community Relationships/Partnerships:

During the summer of 2017, Dr. Coyner did a number of media appearances along with a free public lecture at the Coos Bay Public Library regarding the August 21, 2017 total solar eclipse. As part of the information campaign for this event, Dr. Coyner made two appearances on KCBY television, conducted an interview with The World newspaper, engaged students at the SW Oregon Boys and Girls Club in an outreach discussion about the eclipse, and appeared on Hooked on Oregon Radio to discuss eclipse science and the scientific goings on at Southwestern. In addition, faculty from chemistry, geology, physics, and forestry along with representatives of Southwestern Foundation facilitated discussions with the Beetham Family to initiate the Beetham Family's $1,000,000 match for Health, Science, and Technology Building funding.

It is our belief that these media relationships and community partnerships will persist in the coming years allowing the physics discipline at Southwestern to develop a recognizable footprint both on the campus and in the community. Our intention as a program is to use our new projects through OSGC and

collaborations with other institutions (See Project Planning) as a means of recruiting and community marketing in addition to providing research opportunities to our current and future students.

Curriculum

At present, the physics discipline oversees and conducts course sequences in algebra-based and calculus-based physics as well as general science courses in physics and astronomy. We are attempting to grow the program as we prepare for the move to the Health, Science, and Technology Building in the fall of 2019. To this end, we have proposed a new Associate of Science degree with a physics emphasis for inclusion in the 2018-2019 catalog. We propose this new degree because we believe physics and the other STEM disciplines are fundamental in college education, and are necessary degrees to offer to recruit and encourage modern students facing growing choices in their academic paths and more STEM opportunities being presented. While our STEM disciplines are integral to our transfer degrees such as the AA/OT, OTM, AS/OT Computer Science, AS/OT-Bus, etc., it is our contention that the existence of discipline specific AS degrees and course pathways will serve the Southwestern community in three ways:

- Existing students interested in STEM disciplines will have a more clear, coherent pathway tk2o effective transfer at junior level at their chosen transfer institution.
- Individual degrees in the STEM disciplines will strengthen the overall science programs and offerings at Southwestern. Beginning with physics and chemistry (later expanding to biology, pre-engineering, etc.), students would have many more opportunities to explore science, engineering, and math and will have guidance to prepare them for university level science
- The existence of the degrees in our college catalog will provide prominent promotion within college documentation which will aid in active recruiting of physics and STEM discipline interested students. Active recruiting is anticipated to begin for the 2018-2019 academic year.

Each of these is a valuable aspect to have in a growing program, particularly considering the anticipated facilities upgrades coming in the near future. With Southwestern having the most current and most updated science facilities on the Oregon coast, it is our opinion that we at Southwestern should use these resources both as recruiting tools and collaboration opportunities with both 2-year and 4-year institutions.

Degrees Offered

- Physics courses fill requirements for the AA/OT, AS, AGS, AS/OT-BUS, and OTM degree plans
- In addition, a full AS degree with physics emphasis has been proposed and will go to Instructional Council in January 2018 for inclusion in the 2018-19 academic year catalog. The details and justifications for the AS degree are included below.

Associate of Science (physics emphasis) Proposal

Justification

This proposed Associate of Science in Physics degrees is designed to give students interested in pursuing STEM programs in physics a more complete transfer path than the existing AAOT bulk transfer degree. The logic behind this degree plan is two-fold. First and foremost, it provides the student with the necessary science and math course background to be properly prepared to enter a university physics program at the junior level. The degree in its entirety includes all of the baccalaureate core requirements from Oregon State University and Portland State University to ensure that graduating students have had a well-rounded first two years of undergraduate learning in addition to their science and mathematics focus.

The math and science courses included in the degree plan have been vetted by advising departments at both OSU and PSU. Both advisors and department chairs have stated via email communicatik2on that the courses involved will articulate individually and fulfill the requirements of the initial two years of the universities' respective physics programs. Articulation of individual courses from each university are included in the supporting documentation. The inclusion of CS 161 in the degree plan is in response to a trend in physics education where students are being expected in later years of their program to have a basic understanding of programming and some element of computer science knowledge. BI 203 was included to be consistent with the typical physics major course plan advising guide from OSU.

Given the number of students typically in physics courses at a 4-year institution, many students find it beneficial to take the courses at their community college prior to transferring, favoring classes of 10 to 20 students over the potential of up to 300 students in a PH 201 course. Having a physics degree offered will allow Southwestern to more actively recruit students into physics and other STEM disciplines by making it easier for prospective students to be aware of our existing and growing program.

Offering the AS degree in physics is a necessary step in combination with our involvement with the Oregon NASA Space Grant Consortium and other potential student opportunities we are actively pursuing. The degree path would provide interested students a clear process by which they could come to Southwestern to complete their introductory portion of the physics curriculum and the baccalaureate core prior to transfer to Oregon State or Portland State.

The degree courses are included on the next page as well and transfer information for the universities mentioned.

Proposed Coursework Sequence

First Year

Fall Term			
MTH	251	Differential Calculus	4
CHEM	221	General Chemistry I	5
WR	121	English Composition	3
elective		Western Culture*	3
Winter Term			
MTH	252	Integral Calculus	4
CHEM	222	General Chemistry II	5
WR	227	Technical Writing	3
elective		Diff. Power Discrimination*	3
Spring Term			
MTH	253	Series Calculus	4
CHEM	223	General Chemistry III	5
BIO	203	General Biology	4
SP	111	Public Speaking	3
	or		
SP	112	Intro to Persuasion	3

Second Year

Fall Term			
PH	211	General Physics I (w/calc)	5
MTH	254	Multivariable Calculus	4
elective		Cultural Diversity*	3
elective		Social Processes and Inst.*	3
Winter Term			
PH	212	General Physics II (w/calc)	5
MTH	255	Vector Calculus	4
CS	161	Intro to Computer Science I	3
elective		Literature and the Arts*	3
Spring Term			
PH	213	General Physics III (w/calc)	5
MTH	256	Differential Equations	4
MTH	260	Linear Algebra/Matrix	4
PE	231	Lifetime Health and Fitness	3
Total			**92**

Articulations

Course Equivalencies and Articulations (OSU)

Southwestern Course	OSU Course Equivalent Articulation
BI 203	LDT Introductory Biology
CH 221	CH 231 & 261
CH 222	CH 232 & 262
CH 223	CH 233 &263
MTH 251	MTH 251
MTH 252	MTH 252
MTH 253	MTH 253
MTH 254	MTH 254
MTH 255	MTH 255
MTH 256	MTH256
MTH 260	** LD LINEAR ALGEBRA
SP 111 OR 112	COMM 111 OR COMM 114
PH 211	PH 211 AND PH 221
PH 212	PH 212 AND PH 222
PH 213	PH 213 AND 223
WR 121	WR 121
WR 227	WR 327 * LD TECHNICAL WRITING

** MTH 260 at SWOCC does not directly count for transfer credit to MTH 314 but is strongly suggested and supported by OSU Physics Advising

Electives in the degree plan are consistent with the electives for OSU Baccalaureate Core.

Portland State University

18 Matches

The matches below indicate specific courses you may be awarded after completing and transferring, assuming you earned a passing grade in the transferred course. Matches may change depending upon your major.

Courses from:

Southwestern Oregon Community College

- BI203 Introductory Biology 2017 → BI253
- CHEM221 General Chemistry I 2017 → CH221, CH227
- CHEM222 General Chemistry II 2017 → CH222, CH228
- CHEM223 General Chemistry III 2017 → CH223, CH229
- CS161 Introduction to Computer Science I 2017 → CS161
- MTH251 Calculus I Differential Calculus 2017 → MTH251
- MTH252 Calculus II Integral Calculus 2017 → MTH252
- MTH253 Calculus III 2017 → MTH253
- MTH256 Differential Equations 2017 → MTH256
- MTH260 Matrix Methods and Linear Algebra 2017 → MTH261
- PE231 Wellness for Life 2017 → PHE295

PH211 Gen Physics w/Calculus I 2017 → PH211, PH214

PH212 Gen Physics w/Calculus II 2017 → PH212, PH215

PH213 Gen Physics w/Calculus III 2017 → PH213, PH216

SP111 Fundamentals of Public Speaking 2017 → SP220

WR121 English Composition 2017 → WR121

WR227 Report Writing 2017 → WR227

MTH254 Vector Calculus I 2017 , MTH255 Vector Calculus II 2017 → MTH254, MTHLD

Courses Offered

The physics discipline currently consists of 8 courses (2 physics sequences, and 2 general science courses).

- PH 201 General Physics I – Algebra-based investigation of the principles of Newtonian mechanics, energy and momentum conservation laws, and concepts of rotation and material strengths.
- PH 202 General Physics II – Algebra-based continuation of the sequence focusing of oscillations, fluids, waves, optics, and thermodynamics
- PH 203 General Physics III – Completion of the algebra-based series focused on electricity, magnetism, and their applications
- PH 211 General Physics I with Calculus - Calculus-based investigation of the principles of Newtonian mechanics, energy and momentum conservation laws, and concepts of rotation.
- PH 212 General Physics II with Calculus – Continuation of the calculus-based sequence focused on oscillations, fluids, waves, and optics
- PH 213 General Physics III with Calculus -Conclusion for the calculus-based sequence focused on electricity and magnetism.
- GS 104 Physical Science – General overview of conceptual physics typically for non-STEM majors although students from all disciplines have been enrolled
- GS 107 Astronomy – A general overview of both observational and theoretical astronomy

The most important development concerning courses since the last review is the support from the administration to run the full sequence of the algebra-based course. Until 2016, only the PH 201 was supported as it was a requirement for a direct transfer degree in forestry and natural resources. Research into all STEM disciplines offered at the University of Oregon, Oregon State University, and Portland State University shows than many offer alternate paths where either the algebra or calculus based physics sequences can fill physics requirements for the student's chosen discipline. In 2016, 3 students were able to complete the series, though the PH 202 and PH 203 courses were taught as reading and conference because the courses had not been officially offered in several years. Beginning in the 2017-18 academic year, the full algebra-based sequence is being offered. Though enrollment numbers for this initial class are not ideal given the limitations of losing the forestry students after PH 201. Running the sequence unhindered for an academic year will be an overall benefit to the discipline as it will show students and advisors alike that the sequence is and will continue to be an active path both for future physics students and for STEM career students need laboratory sciences for their respective transfer degrees. It is imperative to continue both algebra-based and calculus based options of the physics sequence each year for three fundamental reasons:

1. Physics is a fundamental part of nearly all STEM degrees; however, the various disciplines are split in preference between calculus-based and algebra-based focus.
2. Offering both sequences provides a well-rounded and balanced program allowing for the recruitment of students from diverse background of scientific interests. This broadens the discipline's reach into the Southwestern student population.
3. Going into the new building and the period of expected growth, a complete program being offered is more likely to be sustainable following the initial uptick due to the new facilities.

In the calculus-based series, enrollment counts have fluctuated from 8-10 in 2015-16, to 16-18 in 2016-17 and thus far 13 initially in 2017-18. It is difficult to discern a trend at this point, but our hope is with the introduction of the new degree path, more thorough advising, and active recruiting, we will continue to see growth in both sequences.

Since the last program review, we have revived the GS 107 Astronomy course. It has been offered during the spring the last two years, and online during the summer last year. The decision to have astronomy in the spring was largely based on weather to allow for better probability of good observing. The spring 2017 course did not have much luck though as clouds and rain were ever-present. Enrollments for astronomy have been steady at 25 to 30 in the two spring terms it has been offered and around 10 students for the summer.

Discussions have been started about the creation of non-lab GS course in meteorology though this course is still being designed. The physics discipline would also be improved by the inclusion and development of a more mathematical astronomy course, a planetary science course and or a cosmology course. We believe these courses would build a foundation for students wishing to pursue astronomy or space sciences degrees. In the coming weeks, Dr. Coyner will be reaching out to the astronomy department of the University of Washington to discuss the best means of building an astronomy pathway in addition to physics.

Career Pathways/Course of Study efforts

Course of study efforts summarized in the proposal for the new AS degree above.

Delivery Methods/ Instructional Methodology

Most courses in the physics discipline have been taught using traditional face to face delivery methods in combination with online resources and homework software. Many courses are standard lectures. Powerpoint lecture slides are used as a base augmented with examples on whiteboard or use of smartboard technology. One day per week, the PH 211-213 sequence students work in groups in the Laker Learning Commons on practice problems to reinforce concepts and mathematical processes from lectures. Each course also contains laboratory exercises and simulations for hands on practice of physics and astronomy principles. In addition, each course features a research paper and presentation on either famous physicists/astronomers (GS 104/107) or ongoing research in fields of physics consistent with topics in each segment of the physics sequences.

Articulation

Courses within the physics sequences have been verified to articulate at the University of Oregon, Oregon State University, and Portland State University. Email verifications have been sent in correspondence with chairs at OSU and PSU during the Associate of Science degree planning. Courses will be continually evaluated and adjusted to insure clear and consistent articulation each year.

For the GS courses, we find in articulation tables for the state of Oregon's institutions that GS 104 and 107 articulate as lower division introduction to physics and astronomy courses contained within the physics departments of the respective institutions. It is our contention that converting the general science courses to introductory courses in their respective disciplines would be beneficial to the students in clarifying the nature of the courses. Currently in our catalog both GS 104 and 105 are listed

as Physical Science. Under a new setup described above, GS 104 would be come PH 104 Conceptual Physics and GS 105 would be a CH 105 introductory chemistry course for example. While there is a concern that calling the GS classes what they contain may intimidate some students prior to registering, it is in the best interest of the college to attempt to mirror the articulation tables of the state universities.

Scheduling Concerns

There have been a few scheduling concerns that have arisen over the past year that have been somewhat problematic for the physics program. The biggest of these concerns is the extension of calculus courses to five days a week. While I do not doubt that these courses warrant five days a week, the exact scheduling is a concern as the Thursday hour of the calculus series happens to interfere with physics and chemistry lab times. In past years, there was not a calculus session on Thursday. This allowed Thursday to be open for physics, chemistry, biology, and geology labs. With the addition of the organic chemistry series, the PH 211-213 labs had been moved to Thursdays at 11:00am so the physics labs would not conflict with organic chemistry labs. However, the current time for the calculus series is scheduled for every day between 11:00-11:50am, conflicting with the first hour of the PH 211-213 labs.

In a few cases, students who work day jobs outside of school have been unable to proceed with physics courses because the class time occurs during their work schedule. The possibility of additional physics students for evening courses may be worth exploring when Southwestern begins to use a new e-scheduling program in the coming months.

Currently, GS 104 runs in fall and winter term with lower numbers in the winter term. In the coming years, we intended to create a meteorology course (either as a lab or non-lab science course) which could take the place of the winter GS 104 course and provide another science option for non-STEM majors. The outline for the meteorology course should be presented to Instructional Council in the coming weeks allowing this opportunity to move forward.

Instructional Resources

The physics sequences are taught with traditional face-to-face teaching methodologies. Each course has a significant online component included in the form of online homework through initially MasteringPhysics and then through a program called The Expert TA. Physics courses began using The Expert TA for online homework during the 2016-2017 academic year following student issues and dissatisfaction with the MasteringPhysics platform.

After discussions with colleagues at Oregon State University in January 2017, The PH 211-213 series began to incorporate one day per week where students collaborate on group assignment practice problems in the Laker Learning Commons each Tuesday. A student from the 2016-2017 PH 211-213 sequence recently mentioned that the Laker Learning Commons group work was very beneficial to her as she transferred from Southwestern to biochemistry at The University of Oregon. She said the group learning experience and practice was a beneficial tool in learning new concepts in her new classes post-transfer.

The general science courses have been taught both as face-to-face courses and online over the summer term. Results for the online GS 104 class have been similar to those taught face to face though their have been some adaptations have been made with the online lab exercises to increase their effectiveness.

Open Educational Resources

Beginning in the spring term of the 2016-17 academic year, The GS 107 astronomy course was taught using the OER textbook *Astronomy* by Fraknoi et al. published by Rice University as part of their Openstax program. The course was taught face to face with the Openstax text in the spring term thanks in part to an OER adoption grant through the Open Oregon program. In comparison to comments from students prior to the changeover, student response was positive to the OER text compared to my previous Pearson text and MasteringAstronomy software.

In addition to the astronomy text change, the physics sequences were both formally switched to Openstax OER textbooks beginning in Fall 2017. The Openstax texts were used during the latter portions of the 2016-17 sequences for supplemental problems and group assignments during that time. The OER texts mentioned above will be the primary texts for the respective classes going forward for the coming years. That said, the texts will be reevaluated each year for content and student accessibility,

Students

Student Populations

Enrollment counts in the physics discipline have not shown a clear trend since 2015. The PH 201-203 series is on an upward slope over the three-year span. None of the algebra based sequence courses were offered in 2013 and 2014. In 2015, only PH 201 was offered (as a requirement for the Forestry and Natural Resources program). As a result, only 5 students were enrolled in the course. In 2016, we made a first attempt to run the full sequence. PH 201 had an initial 4 students that completed. 2 moved on to PH 202. PH 203 had 3 students as one student took the course who had completed the first two parts of the series at Oregon State University. For 2017-18, the PH 201 series started with 11 students (though 2 dropped early so only 9 completed). The increase in student enrollment is believed due to increased advising guidance given to faculty and advisors prior to fall enrollment.

The calculus-based sequence has had fluctuations from 2013 to present. It is difficult to discern a trend as year by year fluctuations. For the sequence ranging from 8 students to 20. Many of the students in the program since 2015 have been pre-engineering or STEM discipline AA-OT seeking students. These areas of students fluctuate from year to year. Our hopes are that the introduction of the AS degree with a physics emphasis will allow for more recruiting of students and a larger course enrollment as the program grows.

The general science component of the physics discipline has grown each year through 2016-17. Academic year. In 2013, there were a total of 20 students in the GS 104 class. The numbers for GS 104 have gone up every year to 51 students in 2016-17. Astronomy was not offered until 2015-16 and beyond. The initial year had 29 students

Gender/Age/Ethnicity Data

Program Gender

		2013	2014	2015	2016
Student Unduplicated Count	Female	10.0	18.0	30.0	52.0
	Male	26.0	30.0	34.0	43.0
% Difference Unduplicated Students	Female		80.00%	66.67%	73.33%
	Male		15.38%	13.33%	26.47%
Course Count	Female	4.0	4.0	6.0	6.0
	Male	4.0	4.0	6.0	8.0
% Difference Course Count	Female		0.00%	50.00%	0.00%
	Male		0.00%	50.00%	33.33%
Section Count	Female	4.0	4.0	6.0	9.0
	Male	4.0	4.0	6.0	11.0
% Difference Section Count	Female		0.00%	50.00%	50.00%
	Male		0.00%	50.00%	83.33%
FTE Reimbursable	Female	1.7	3.9	4.8	9.6
	Male	7.9	7.8	7.1	8.9
% Difference in FTE Reimbursable	Female		125.62%	22.66%	100.00%
	Male		-2.02%	-9.42%	26.18%
BillingCredits	Female	51.0	126.0	144.0	313.0
	Male	249.0	266.0	223.0	296.0
% Difference in Billing Credits	Female		147.06%	14.29%	117.36%
	Male		6.83%	-16.17%	32.74%
Student Unduplicated Count	**Total**	**36.0**	**48.0**	**64.0**	**95.0**
% Difference Unduplicated Students	**Total**		**33.33%**	**33.33%**	**48.44%**
Course Count	**Total**	**4.0**	**4.0**	**6.0**	**8.0**
% Difference Course Count	**Total**		**0.00%**	**50.00%**	**33.33%**
Section Count	**Total**	**4.0**	**4.0**	**6.0**	**11.0**
% Difference Section Count	**Total**		**0.00%**	**50.00%**	**83.33%**
FTE Reimbursable	**Total**	**9.7**	**11.7**	**11.9**	**18.5**
% Difference in FTE Reimbursable	**Total**		**20.87%**	**1.32%**	**56.10%**
BillingCredits	**Total**	**300.0**	**392.0**	**367.0**	**609.0**
% Difference in Billing Credits	**Total**		**30.67%**	**-6.38%**	**65.94%**

Program Age Category

		2013	2014	2015	2016
Student Unduplicated Count	Under 16				1.0
	16 - 17 Years	4.0	1.0	2.0	5.0
	18 - 20 Years	21.0	24.0	48.0	61.0
	21 - 24 Years	6.0	8.0	8.0	17.0
	25 - 29 Years	4.0	9.0	3.0	6.0
	30 - 39 Years	1.0	4.0	1.0	4.0
	40 - 49 Years		2.0		
	50 - 59 Years			1.0	1.0
	60 - 90 Years			1.0	
% Difference Unduplicated Students	Under 16				
	16 - 17 Years		-75.00%	100.00%	150.00%
	18 - 20 Years		14.29%	100.00%	27.08%
	21 - 24 Years		33.33%	0.00%	112.50%
	25 - 29 Years		125.00%	-66.67%	100.00%
	30 - 39 Years		300.00%	-75.00%	300.00%
	40 - 49 Years			-100.00%	
	50 - 59 Years				0.00%
	60 - 90 Years				-100.00%
Course Count	Under 16				1.0
	16 - 17 Years	4.0	1.0	1.0	5.0
	18 - 20 Years	4.0	4.0	6.0	8.0
	21 - 24 Years	4.0	4.0	3.0	7.0
	25 - 29 Years	3.0	4.0	4.0	7.0
	30 - 39 Years	3.0	4.0	1.0	1.0
	40 - 49 Years		1.0		
	50 - 59 Years			1.0	1.0
	60 - 90 Years			2.0	
% Difference Course Count	Under 16				
	16 - 17 Years		-75.00%	0.00%	400.00%
	18 - 20 Years		0.00%	50.00%	33.33%

Program Demographics

		2013	2014	2015	2016
Student Unduplicated Count	American Indian or Alaska Native	2.0	3.0	3.0	3.0
	Asian	1.0	1.0		3.0
	Black or African American		2.0	2.0	2.0
	Hispanics of any race	2.0	3.0	10.0	7.0
	Native Hawaiian or Other Pacific Islander	1.0		1.0	5.0
	Nonresident Alien		4.0	1.0	1.0
	Two or more races	2.0	3.0	2.0	7.0
	Undisclosed	8.0	5.0	1.0	3.0
	White	20.0	27.0	44.0	64.0
% Difference Unduplicated Students	American Indian or Alaska Native		50.00%	0.00%	0.00%
	Asian		0.00%	-100.00%	
	Black or African American			0.00%	0.00%
	Hispanics of any race		50.00%	233.33%	-30.00%
	Native Hawaiian or Other Pacific Islander		-100.00%		400.00%
	Nonresident Alien			-75.00%	0.00%
	Two or more races		50.00%	-33.33%	250.00%
	Undisclosed		-37.50%	-80.00%	200.00%
	White		35.00%	62.96%	45.45%
Course Count	American Indian or Alaska Native	4.0	4.0	2.0	2.0
	Asian	3.0	3.0		2.0
	Black or African American		1.0	2.0	1.0
	Hispanics of any race	1.0	3.0	6.0	5.0
	Native Hawaiian or Other Pacific Islander	3.0		1.0	2.0
	Nonresident Alien		4.0	1.0	3.0
	Two or more races	4.0	4.0	1.0	5.0
	Undisclosed	4.0	4.0	1.0	2.0
	White	4.0	4.0	6.0	8.0
% Difference Course Count	American Indian or Alaska Native		0.00%	-50.00%	0.00%
	Asian		0.00%	-100.00%	
	Black or African American			100.00%	-50.00%
	Hispanics of any race		200.00%	100.00%	-16.67%
	Native Hawaiian or Other Pacific Islander		-100.00%		100.00%
	Nonresident Alien			-75.00%	200.00%

Recruitment

Active recruiting for physics has not been a consideration in recent years. With the growing relationship with the Oregon Space Grant Consortium and several interesting physics projects on the horizon (see projects and long-term goals later in this document) active recruiting will be essential and will begin at full speed in Winter 2018. Recruiting will take place on multiple levels. We intend to be more involved with the Oregon Coast STEM Hub. We are planning to build a larger social media following through increased Facebook and Twitter outreach. A Facebook page has been created for physics and Space Grant events. This will be used to share our events and reach out to the community, current, former, and prospective students.

Dr. Coyner will continue making presentations and media presentations. Our intention is to also reach out directly to local high schools and community organization. Coos Bay Public Library hosted Dr. Coyner for a public lecture in August 2017 for a discussion of the 2017 Great American Solar Eclipse. We intend

to continue to put together lectures which will be open to students and community members, using these as means of recruiting as well.

Advising

Beginning in Spring 2017, Dr. Coyner circulated to all advisors the documents below showing the physics courses required for various majors statewide. The initial results more than doubled the enrollment in the algebra-based sequence, PH 201 to 203. Overall enrollment in physics for Fall 2017 was 22 students (9 for PH 201 and 13 for PH 211). While it is too early in the process to assess a meaningful trend, the initial increase in PH 201 is significant and positive. It will be important to evaluate and continue to assess these data in subsequent years. The physics requirements for all disciplines will be monitored and updated for advisors prior to each term's advising. The current list of requirement information is included below.

Science Program Physics Requirements for OSU							
Program	201	202	203	211	212	213	
All Engineering				x	x	x	
Biology	x	x	x				
Chemistry Track I				x	x	x	
Biochem/Microbiology	x	x	x	o	o	o	option to take either track but must take one
Biochemistry	x	x	x	o	o	o	option to take either track but must take one
Biochem/Biophysics				x	x	x	
Materials Science				x	x	x	
Forensic Science	x	x	x	o	o	o	option to take either track but must take one
Chemistry Track II	x	x	x	o	o	o	option to take either track but must take one
Geology	x	x	o	o	o	o	option to take either track but must take one
Climate Science	x	x	x	o	o	o	option to take either track but must take one
Physics				x	x	x	
Food Sciences	x	x	x				
Ocean Science	x	x	o	o	o	o	
Forestry	x						
Microbiology	x	x	x				
Computer Science				x	x	x	
Math				x			Bacc Core Lab Science
Pre-Pharmacy	x	x	x	o	o	o	option to take either track but must take one
Pre-Med	x	x	x				

Science Program Physics Requirements for U of O							
Program	201	202	203	211	212	213	
Physics				x	x	x	
All Engineering				x	x	x	
Computer Science	x	x	x	o	o	o	
Chemistry	x	x	x	o	o	o	
Biochemistry	x	x	x	o	o	o	
Biology	x	x	x	o	o	o	
Geology	x	x		o	o		
Geophysics				x	x	x	
Environmental Geology	x	o	o	o	o		
Paleontology	x						
Human Physiology	x	x	x	o	o	o	
Math/CS	x	x	x	o	o	o	

Student Satisfaction

Student satisfaction reports for physics and GS courses have been analyzed from Fall 2015 to present. Many students comment both in the surveys and in conversations with Dr. Coyner and other staff members about the difficulty and challenge involved in physics courses; however, many of these challenges are specific to the course material more than the teaching or presentation style. Student feedback for Fall 2017 from all three courses (with limited sample sizes) was largely positive showing average ratings between 4.0 and 5.0 for all survey questions regarding the course and the instructor. Similar results were show previous terms. Typical comments and concerns that are being address are the more timely return of homework and occasional concern over students feeling lost at times. Additional office hours have been setup to allow students more access to ask questions

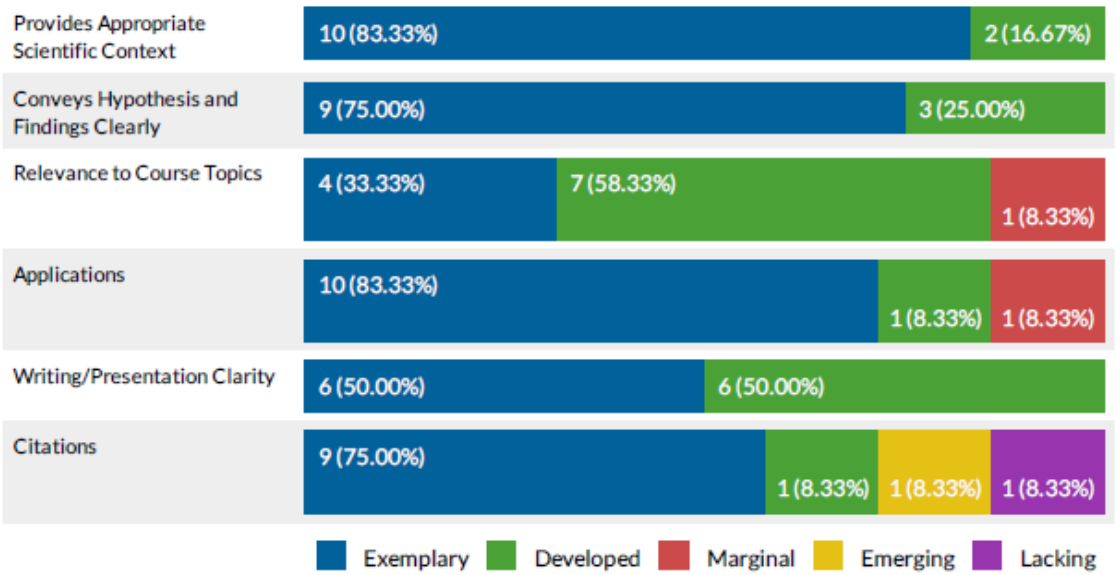
Comments are generally favorable

Assessments

Fall 2016

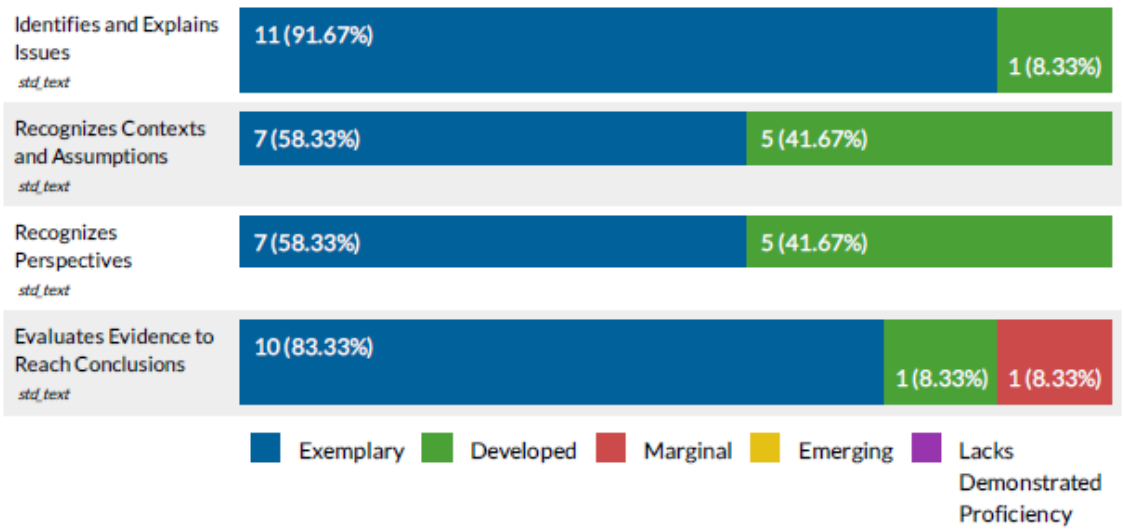
Rubric View: Rubric

	Exemplary (0 pts)	Developed (0 pts)	Marginal (0 pts)	Emerging (0 pts)	Lacking (0 pts)	*Mean*	*Mode*	*Stdev*
Provides Appropriate Scientific Context	10	2	0	0	0	0.000	0.000	0.000
Conveys Hypothesis and Findings Clearly	9	3	0	0	0	0.000	0.000	0.000
Relevance to Course Topics	4	7	1	0	0	0.000	0.000	0.000
Applications	10	1	1	0	0	0.000	0.000	0.000
Writing/Presentation Clarity	6	6	0	0	0	0.000	0.000	0.000
Citations	9	1	0	1	1	0.000	0.000	0.000



Rubric View: GSLO CCAT

	Exemplary (0 pts)	Developed (0 pts)	Marginal (0 pts)	Emerging (0 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Identifies and Explains Issues	11	1	0	0	0	0.000	0.000	0.000
Recognizes Contexts and Assumptions	7	5	0	0	0	0.000	0.000	0.000
Recognizes Perspectives	7	5	0	0	0	0.000	0.000	0.000
Evaluates Evidence to Reach Conclusions	10	1	1	0	0	0.000	0.000	0.000



Winter 2017

Physics 212 Outcomes Assessment Report

Course Level Outcomes

Course Outcome	Measurable Criterion	Measurement Tool	Courses	Time Frame
Apply conservation laws (energy and momentum) to analyze the behavior of physical systems and to understand when to apply these laws.	Score of at least 3 on Final Exam Rubric section on conservation laws Or A total of at least 20 of 27 points on the final exam questions involving conservation of energy or momentum	Group of 3 questions on the final exam of PH 212 using conservation laws of energy and momentum	PH 212	Winter 2017

Results: Of 14 students included in the Livetext eligible students, 13 scored at least proficient in problems involving conservation laws (3 exemplary, 10 proficient) for a success rate of 93%

Analysis: The final exam questions covered conservation of energy through a roller coaster type application, rotational kinetic energy of a rolling object, and angular momentum conservation. I included this range of evaluation to cover the many topics discussed during the PH 212 term involving conservation laws.

Plan: Going forward I will continue to emphasize conservation laws and continue to address applications to everyday life outside of the classroom.

Course Outcome	Measurable Criterion	Measurement Tool	Courses	Time Frame
Understand how to represent and analyze motion for fluids, oscillations and waves.	Score of at least 3 on Final Exam Rubric section on oscillations/waves/fluids Or A total of at least 20 of 27 points on the final exam questions	Group of 3 questions on the final exam of PH 212 concerning fluids, oscillations and waves.	PH 212	Winter 2017

Results: Of 14 students included in the Livetext eligible students, only 6 scored at least proficient in problems involving oscillations, fluids, and waves (4 exemplary, 2 proficient) for a success rate of only 43%. The remaining 8 students showed an emerging proficiency but a struggle with concepts of simple harmonic motion.

Analysis: Simple harmonic motion problems were a struggle for many students. Some additionally struggled with applications of Bernoulli's Principle and pressures. In previous assignments, more students showed an ability to comprehend and process these problems; however, in the final culminating test, this seemed to be a stumbling block.

Plan: Clearly more concentration and emphasis needs to be placed on simple harmonic oscillations and their applications. More lecture examples and additional problems and experiments will be devised and incorporated.

Course Outcome	Measurable Criterion	Measurement Tool	Courses	Time Frame
Understand and apply principles of torque, elasticity, and rotational equilibrium	Score of at least 3 on Final Exam Rubric section on torque/elasticity Or A total of at least 20 of 27 points on the final exam questions	Group of 3 questions on the final exam of PH 212 using torque, elasticity, and rotational equilibrium	PH 212	Winter 2017

Results: Of 14 students included in the Livetext eligible students, 11 scored at least proficient in problems involving torque, elasticity, and equilibrium (6 exemplary, 5 proficient) for a success rate of 78.6% .The remaining 3 students showed an emerging proficiency.

Analysis: While more time could and should be spent to address the effects of torque and elasticity with more practical examples. Nearly 80 percent of the students are demonstrating proficiency while the remaining students show emerging skills.

Plan: Continue to emphasize torque and its implication for rotating systems. Emphasize rotational kinematics (angular velocities and angular accelerations). Use more tangible example for elasticity and compressions.

Course Outcome	Measurable Criterion	Measurement Tool	Courses	Time Frame
Make observations of physical behavior and find explanations of sound applications that are consistent with the observations, apply these explanations to make predictions about outcomes of experiments	Score of at least 3 on Final Exam Rubric section on sound Or A total of at least 27 of 36 points on the final exam questions.	Group of 4 questions on the final exam of PH 212 using sound and its applications.	PH 212	Winter 2017

Results: Of 14 students included in the Livetext eligible students, 8 scored at least proficient in problems involving sound and its applications (Doppler Effect, musical instruments, etc.) (2 exemplary, 6 proficient) for a success rate of 57.1% .The remaining 6 students showed an emerging proficiency.

Analysis: Sound and its applications consisted of two weeks of lecture time near the time of the final. While these two weeks are sufficient for some students, it is possible that additional lectures and work on sound should be incorporated.

Plan: Continue to emphasize fundamentals while also incorporating more practical examples. Develop a lab and principles of sound waves to be more complete than the musical pipe lab performed this term.

Course Outcome	Measurable Criterion	Measurement Tool	Courses	Time Frame
Apply fundamental physics principles of optics to analyze the behavior of physical situations	Score of at least 3 on Final Exam Rubric section on sound Or A total of at least 27 of 36 points on the final exam questions.	Group of 4 questions on the final exam of PH 212 using optics and the principles of reflection, refraction, and diffraction.	PH 212	Winter 2017

Results: Of 14 students included in the Livetext eligible students, 9 scored at least proficient in problems involving optical principles and applications (1 exemplary, 8 proficient) for a success rate of 64.3% .Of the remaining 5 students, 3 showed an emerging proficiency while 2 lacks demonstrable proficiency

Analysis: Optics was rushed in the final week of the term. The two cases of lacked demonstrable proficiency were students that had not studied the optics material in preparation.

Plan: Incorporate optics earlier and emphasize its principles with additional practice problems and a lab exercise.

Spring 2017

PH 213 General Physics III w/calculus Assessment Report
Spring 2017

Part I: Content Evaluation

Course Outcome	Measurable Criterion	Measurement Tool	Course	Time Frame
Apply foundational knowledge and models of electrical forces and field to analyze and/or predict phenomena.	At least 70% of students measured score at least 3 points on the electric forces and fields component of the final exam rubric indicating developed proficiency.	A group of 4 questions within the comprehensive final exam demonstrating both fundamental understanding and applications.	PH 213 General Physics III w/calculus	Spring 2017

Of 12 degree seeking students tested to date, (1 student is completing an incomplete and is not included yet) 8 students demonstrated exemplary proficiency, showing a strong ability to describe and calculate problems involving the electric force generated by collections of point charges or other charge distributions. Also demonstrated an ability to process these concepts in multiple scenarios. The other 4 students demonstrated developed proficiency showing an understanding and an ability to apply the concepts with only a few minor errors. 12 of 12 students demonstrated at least developed proficiency for 100%

Analysis: The students in this course demonstrated proficiency with electric fields and forces. In the coming years, I will continue to emphasize these concepts and will develop additional laboratory exercises and applications to reinforce them.

Course Outcome	Measurable Criterion	Measurement Tool	Course	Time Frame
Apply foundational knowledge and models of energy, potential and electric flux along with Gauss's Law to analyze and/or predict phenomena.	At least 70% of students measured score at least 3 points on the electric forces and fields component of the final exam rubric indicating developed proficiency.	A group of 3 questions within the comprehensive final exam demonstrating both fundamental understanding and applications.	PH 213 General Physics III w/calculus	Spring 2017

The 12 degree-seeking students evaluated were evenly split into three groups regarding Gauss's Law problems and electrical potentials and energy. 8 of 12 students demonstrated exemplary or developed proficiency while 4 students demonstrated marginal proficiency. 67% of measured students met the measurable criterion as described above.

Analysis: Gauss's Law and the concept of electric flux and potential are admittedly concepts that are difficult to grasp because much of the work and application is theoretical more so than direct practical applications. To emphasize the practical relation of Gauss's Law to direct applications, I will be adding a variety of new example problems, simulations, and a newly developed laboratory assignment to the course in Spring 2018.

Course Outcome	Measurable Criterion	Measurement Tool	Course	Time Frame
Apply foundational knowledge and models of resistivity, resistors, and capacitors to analyze and/or predict phenomena.	At least 70% of students measured score at least 3 points on the electric forces and fields component of the final exam rubric indicating developed proficiency.	A group of 3 questions within the comprehensive final exam demonstrating both fundamental understanding and applications.	PH 213 General Physics III w/calculus	Spring 2017

Of 12 degree seeking students tested to date, 7 students demonstrated exemplary proficiency, showing a strong ability to describe and calculate problems involving resistivity of wires and materials, the direct application of resistance, and the foundations and application of parallel plate capacitor concepts and models. Also demonstrated an ability to process these concepts in multiple scenarios. The other 5 students demonstrated developed proficiency and the ability to apply the concepts with only a few minor errors. 12 of 12 students demonstrated at least developed proficiency for 100%

Analysis: The students in this course demonstrated proficiency with resistivity and capacitance; however, I noticed over the course of the term that the students would benefit from additional demonstrations and lab practical experience. A better capacitor lab will be developed for initial inclusion in Spring 2018.

Course Outcome	Measurable Criterion	Measurement Tool	Course	Time Frame
Apply foundational knowledge of basic circuit analysis to determine values of voltage, current, resistance, charge, and power.	At least 70% of students measured score at least 3 points on the circuit analysis component of the final rubric	A group of 3 questions within the comprehensive final exam demonstrating both fundamental understanding and applications.	PH 213 General Physics III w/calculus	Spring 2017

12 of 12 students showed at least developed proficiency in basic circuit analysis in DC circuits with resistors, capacitors, and combinations. 7 were exemplary, 5 showed developed understanding

Analysis: Circuits was one of the more practical and hands-on sections of material covered. While it was covered quickly the students have in feedback corroborated my assessment that they felt more comfortable with this section of material.

Course Outcome	Measurable Criterion	Measurement Tool	Course	Time Frame
Apply foundational knowledge of magnetic fields.	At least 70% of students measured score at least 3 points on the magnetic field and applications portion of the exam.	A group of 3 questions within the comprehensive final exam demonstrating both fundamental understanding and applications.	PH 213 General Physics III w/calculus	Spring 2017

Magnetic fields content was one of the components of the course that saw students struggle most. 8 of 12 students were either exemplary or developed. 4 showed a marginal proficiency of 2 points on the rubric.

Analysis: Magnetic fields were rushed at the end of the term. Next year, the change in textbooks and the reorganization of the topics in the text will allow for earlier emphasis and reinforcement.

Course Outcome	Measurable Criterion	Measurement Tool	Course	Time Frame
Apply critical thinking and multiple concept synthesis to solve multi-layer problems	At least 70% of students measured score at least 3 points on the critical thinking synthesis rubric	A group of 3 questions within the comprehensive final exam demonstrating application of multiple concepts simultaneously	PH 213 General Physics III w/calculus	Spring 2017

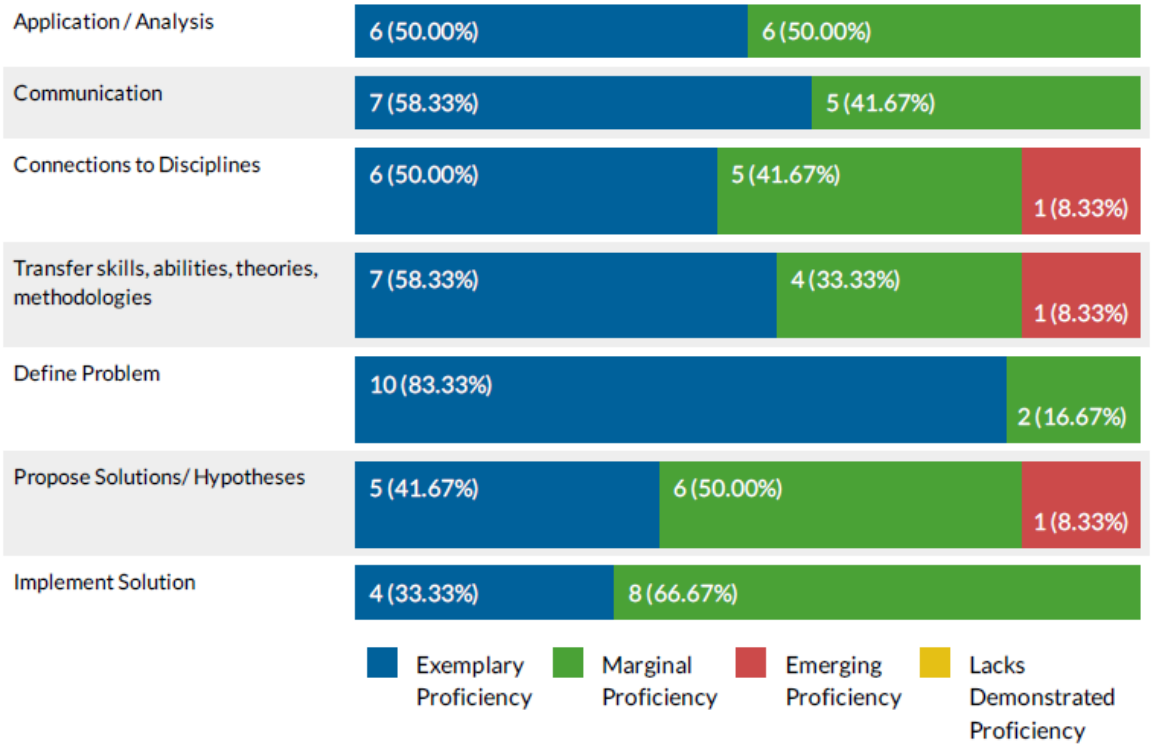
The final piece of the course is to be able to synthesize multiple concepts of the course in one cohesive solution to a complex problem. 3 such problems were given in this term's final and all twelve of the assessed students showed at least developed proficiency in content synthesis.

7 of the 12 students scored exemplary, demonstrating a control and mastery of the individual components as well as an understanding of how the concept intertwine. The remaining 5 students shows a knowledge of the multiple concepts but would find occasional hurdles to complete accuracy.

Building off of this year I will be incorporating more synthesis problems in assignments through the entirety of the calculus-based physics series This will help to reinforce to students that the concepts we focus on are essentially individual building blocks which must be used in order to facilitate understanding of more complex physical situations.

Rubric View: 4GSLO COMP Computation

	Exemplary Proficiency (4 pts)	Marginal Proficiency (3 pts)	Emerging Proficiency (2 pts)	Lacks Demonstrated Proficiency (1 pts)	*Mean*	*Mode*	*Stdev*
Application / Analysis	6	6	0	0	3.500	3.000	0.500
Communication	7	5	0	0	3.583	4.000	0.493
Connections to Disciplines	6	5	1	0	3.417	4.000	0.640
Transfer skills, abilities, theories, methodologies	7	4	1	0	3.500	4.000	0.645
Define Problem	10	2	0	0	3.833	4.000	0.373
Propose Solutions/ Hypotheses	5	6	1	0	3.333	3.000	0.624
Implement Solution	4	8	0	0	3.333	3.000	0.471



The GSLO results for computation are shown above. In my view, this year's students have developed significantly in their approaches to mathematical solutions. The biggest struggles continue to exist in proposing the solution. With guidance, all the students execute this piece well; however, left to their own devices, making the connection between the problem to the solution is a tedious and long road. This is in part due to the vast array of mathematical equations and strategies applied in the physics sequence.

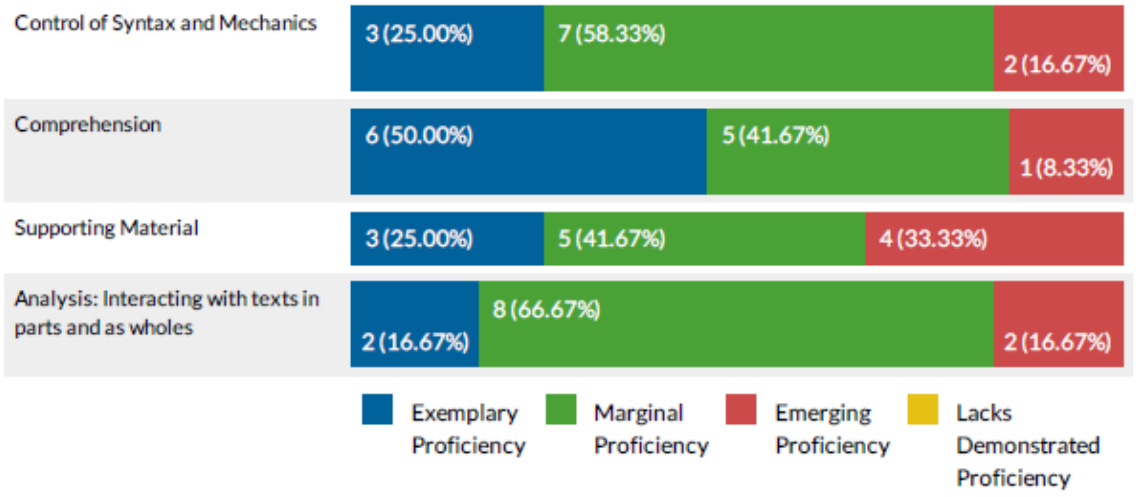
Next year as a progress through the sequence I will continue to reinforce the process as we advance. That along with a new text which presents material in a more logical progression and works with the students to help them learn should greatly benefit the incoming class.

Part II: Communication

I gave the students a research paper to discuss ongoing research in electrical and magnetic applications as part of PH 213. While I assessed the assignment for the content I also viewed it under the microscope of the communication and critical thinking GSLO outcomes. My tabulated results for those cases are shown below.

Rubric View: 4GSLO COMM Communication

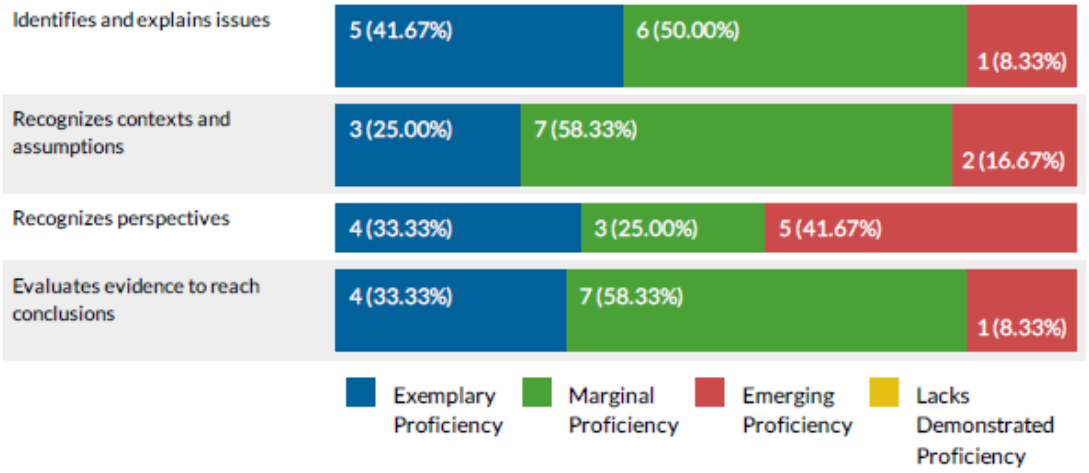
	Exemplary Proficiency (4 pts)	Marginal Proficiency (3 pts)	Emerging Proficiency (2 pts)	Lacks Demonstrated Proficiency (1 pts)	*Mean*	*Mode*	*Stdev*
Control of Syntax and Mechanics	3	7	2	0	3.083	3.000	0.640
Comprehension	6	5	1	0	3.417	4.000	0.640
Supporting Material	3	5	4	0	2.917	3.000	0.759
Analysis: Interacting with texts in parts and as wholes	2	8	2	0	3.000	3.000	0.577



For the communication rubric, the results show a strong ability class wide to communicate their desired information. The largest areas of struggle seem to be with supporting materials, particularly choosing what and where to reference specific details in the study. Part of this is a direct result of the assignment itself. Because I ask them to look specifically at current research, the understanding of what is being studied may elude the students either due to a lack of clarity in the research or aspects of the study that extend beyond the scope of PH 211-213.

Rubric View: 4GSLO CCAT Creative, Critical & Analytical Thinking

	Exemplary Proficiency (4 pts)	Marginal Proficiency (3 pts)	Emerging Proficiency (2 pts)	Lacks Demonstrated Proficiency (1 pts)	*Mean*	*Mode*	*Stdev*
Identifies and explains issues	5	6	1	0	3.333	3.000	0.624
Recognizes contexts and assumptions	3	7	2	0	3.083	3.000	0.640
Recognizes perspectives	4	3	5	0	2.917	2.000	0.862
Evaluates evidence to reach conclusions	4	7	1	0	3.250	3.000	0.595



Assessing my students on critical and analytical thinking from the research paper submissions, I find that most of my students are demonstrating proficiency in all aspects; however, from these results it is apparent the recognizing and defining alternate perspectives and their interplay within studies. I will be including similar research in each term of the series each year and doing what I can to reinforce the need to analyze perspectives presented in the research.

Facilities/Budget

Budget Changes over the review period

Budgets for physics continue to flat and minimal over the entire period since the last review in 2014, At that time the review stated that the physics budget would be re-evaluated and increased when a full-time physics instructor took the reins of the program. Dr. Coyner came to Southwestern in September 2015 and has taken over as full-time physics instructor as an adjunct instructor in 2016 and a visiting appointment in 2017. Budgets for physics have shown **no increase over that period.**

Present budgetary levels do not make it possible to actively grow the physics program. This seems counterproductive at a college which is opening a new building which features in part its science programs in 2019. While physics typically has a low number of majors. Physics courses are imperative to completion of any and all STEM degrees. Biology, chemistry, geology, all types of engineering, math, and other science and allied health disciplines require at least one course in physics as demonstrated in the advising section earlier in this document.

In order to offer sufficient rigor and value in our physics courses and experiences here at Southwestern, significant additional resources will be required. The need for these increases have been acknowledged in conversations with both the Dean of LDC courses and with multiple Vice Presidents of Instruction. All of which have reiterated that this spending is necessary although each new budget cycle does not increase the physics numbers.

Current Budget allocations for Physics 2017-18

- FT Faculty allocated at: $53.500
- General Supplies: $290.00
- Lab and Classroom Supplies: $483.00

$773.00 is laughable as a physics budget as to replace or acquire enough of one lab apparatus will often surpass that number on its own. In 2017-18, Dr. Coyner put forth a budget request of $5000, the details of which are included below. None of these expenditures were approved. A few are being acquired as part of this year's current spending; however, very little of what we feel is needed has been allocated for.

In addition to the day to day operation of courses and supplies needed for the labs, several opportunities for student research and community outreach have become attainable through work with the Oregon Coast STEM hub and the NASA Oregon Space Grant Consortium. Each of these projects will have budgetary implications but the ability to increase the number and quality of students to our physics and other STEM disciplines in our view justifies the increases expenditures and involvement statewide.

Included in the budget request for this year are the supplies necessary to fully equip the lab and additional spending to fund the developing undergraduate research opportunities. Four year institutions across the country have more readily encouraged and expected undergraduate research in recent years. The opportunities we are building here will give Southwestern transfer students a foundation in research they can call upon as they advance in their academic careers.

2018-19 Operating Budget Request

Year	Item	Associated Project/Plan if applicable	Account Number	Amount
2018-19	6 Force Tables for Force Vector Addition Lab w/ additional pulley		101311	756.00
2018-19	3 Dynamics Track Systems for kinematics and optics demonstrations		101311	2004.00
2018-19	3 Demonstration Spring Sets		101311	87.00
2018-19	6 Pendulum clamps		101311	120.00
2018-19	1 Discover Free Fall Demonstration		101311	359.00
2018-19	6 primary/secondary coil systems		101311	390.00
2018-19	Pasco Basic Optics Systems		101311	495.00
2018-19	Diffraction Optics Kit with diode laser		101311	340.00
2018-19	3260 contact breadboard (12)		101311	384.00
2018-19	Stacking Banana Plugs 10 sets of 6 each		101311	186.00
2018-19	Glass Beakers (varied capacities) (50, 150, 250 mL)		101311	350.00
2018-19	5 conducting paint pens		101311	85.00
2018-19	Doppler Demonstration		101311	60.00
2018-19	Pascal's Law Demo		101311	40.00
2018-19	2 5 kg max digital balance		101311	330.00

Year	Item	Associated Project/Plan if applicable	Account Number	Amount
2018-19	Copper electrodes (pack of 12)		101311	21.25
2018-19	6 Digital multimeters with capacitance meters		101311	426.00
2018-19	Banana plug test lead patch cords (15 pairs)		101311	165.00
2018-19	Capacitor kit		101311	54.00
2018-19	Resistor kits		101311	60.00
2018-19	Inductor kit		101311	42.00
2018-19	3 12V AC/DC Power Supplies		101311	498.00
2018-19	**2 laptops for student/faculty research opportunities**	**High Altitude balloon group and Solar data analysis**	**101311**	**1000.00**
2018-19	**3 IDL software licenses**	**Solar Data Analysis**	**101311**	**630.00**
2018-19	**Balloon grade helium**	**High Altitude Balloon group**	**101311**	**450.00**
2018-19	**3500g weather balloons (10)**	**High Altitude Balloon group**	**101311**	**350.00**

Previous Budget Requests

2017-2018

Annual Future Budget Request Amounts

Year	Item	Associated Project/Plan if applicable	Account Number	Amount
2017	3 Force Tables for Force Vector Addition Lab w/ additional pulley		101311	684.00
2017	3 Dynamics Track Systems for kinematics and optics demonstrations		101311	525.00
2017	3 Dynamics track optics kits		101311	507.00

Year	Item	Associated Project/Plan if applicable	Account Number	Amount
2017	3 Demonstration Spring Sets		101311	87.00
2017	6 Pendulum clamps		101311	120.00
2017	1 Discover Free Fall Demonstration		101311	359.00
2017	4 primary/secondary coil systems		101311	260.00
2017	Pasco Basic Optics Systems		101311	499.00
2017	Diffraction Optics Kit with diode laser		101311	359.00
2017	3260 contact breadboard (6)		101311	192.00
2017	Stacking Banana Plugs 5 sets of 6 each		101311	93.00
2017	Glass Beakers (varied capacities) (50, 150, 250 mL)		101311	350.00
2017	5 conducting paint pens		101311	85.00
2017	Doppler Demonstration		101311	60.00
2017	Pascal's Law Demo		101311	40.00
2017	5 kg max digital balance		101311	165.00
2017	Copper electrodes (pack of 12)		101311	21.25

Prospective Equipment list for Health and Science Building

Physics and Engineering Equipment List

Need	Want	Wishlist
6 Force Tables for Force Vector Addition Lab w/ additional pulley	4-6 Pasco Statics Systems	Optics table
6 Dynamics Track Systems for kinematics and optics demonstrations	5 kg max digital balance	Large ripple tank

Resistor and Capacitor kits for circuit lab	6 basic optics ray tables for easier measurement	2 desktop stations for student research
Breadboards, Test leads, 12 digital multimeters	Diffraction optics kits with diode laser	Inflatable planetarium for special events, astronomy presentations, community and high school outreach
Hooke's law springs slotted mass sets and hangers	Solar cells for labs and demos	Coronado Solar Telescope
Class sets of bar magnets and compasses	Electroscopes	IMSA Fusion: Mars Manifest Destiny Curriculum
1 discover free fall apparatus	Digital Oscilloscopes	
Class set of Vernier calipers	Student Spectrometers for Physics and Astronomy Labs	
6 DC programmable power supplies	Deluxe Hydraulic class pack for fluid dynmaics	
6 dynamics track optics kits	Photogate timers	
12 ray optics kits	Ballistic Pendulum Lab	
Venturi tubes, Heroes Fountain fluids demos	Electrodes and Copper Sulfate Solution for Electrolysis Lab	
6 Quantitative Centripetal force apparatus experiments	Inertial Scooter Hovercraft demo	
6-12 primary secondary coil systems	Orbiter Planetarium demo	
Beakers/Graduated Cylinders	Star Theater (Flinn Scientific)	
Class Density Kit	Planetary Orbits Kit	
Function Generators for AC circuits (6)	Impact Crater Kit	
18 V 3A DC power supplies (6)	Telescope Building Kits	
Atwoods machine apparatus (6)		
6-8 Friction on inclined plane kits		

Institutional Assessment Rubric

Mandatory Reporting and Compliance Requirements Assessment

Compliance and mandatory reporting plan developed linked to HEOA, Equity & Inclusions, FERPA, Accreditation, and the Core Themes, Objectives, Success Indicators	 Highly Developed	 Emerging / Partially Developed	 Needs Developed

Comply with ADA, Equal Opportunities Act, and Section 405 of the Rehabilitation Act (Equity & Inclusion webpage; OCR requirement**); short statement on all documents** for public/posted (2 pages or less); **long statement** on all other documents. ***Short:*** *Southwestern Oregon Community College is an Equal Opportunity Educator and Employer;* ***Long:*** *See last page of this document*	x		
FERPA Training completed for all staff within the unit – how do you know? New employees throughout the year?	x		
HEOA required disclosures and reporting completed (link to list available in future – webpage list)	x		
Outcomes and indicators linked to Core Themes, Objectives, Success Indicators; all reports completed on time (Institutional Success Indicator reports if the lead; yearly outcome review and data analysis)		x	
Accreditation standard 2 requirements		x	
Accreditation other requirements		x	
Other required reporting or compliance requirements completed – add here (OSHA, Health Inspections, etc.):	x		
Reflect on what has been accomplished, what is being developed and the documentation of processes:			

Policies, Procedures, Process Assessment

Appropriate policies and procedures for programs and services are established. Policies and procedures assure access to eligible persons, manage resources effectively, assure compliance with applicable regulations, are consistent with accepted standards of professional practice and support the mission and goals of the College.	 Highly Developed	 Emerging / Partially Developed	 Needs Developed
Policies and procedures apply equally and are enforced equally to all persons	x		
Policies and procedures are established and followed for fiscal management.		x	
Policies and procedures are established and followed for personnel management		x	
Policies and procedures are established and followed for the management of consumable supplies, fixed assets and capital facilities.			
Policies and procedures are established and followed that assure compliance with applicable regulations.	x		
Unit handbook, process documentation, manual created, updated yearly, reviewed yearly, followed			x

Policy review schedule updated; all policies listed on schedule			x
Reflect on what has been accomplished, what is being developed and the documentation of processes			

Qualitative Assessment

Appropriate qualitative assessments established.	 Highly Developed	 Emerging / Partially Developed	 Needs Developed
Access to Program(s) and Services: Programs and services are accessible to all eligible persons and additional assistance is provided, when necessary, for persons to be successfully served. Program provides promotional and/or informational material to current and prospective customers in multiple formats. Program provides services to meet the needs of diverse customers (students, staff, business, community).	x		
Organization of Programs and Services: The organization of programs and services promotes effective service delivery, adequate supervision and management and collaboration between administrative units. Customers are satisfied with services delivered. Services are delivered within allocated budget. Collaboration with other administrative units as needed.		x	
Programs and Services Provided: The programs and services provided are adequate to meet the needs of students, staff and the community consistent with the mission and goals of the College. Link to Core Themes, Objectives, and Success Indicators. Indicators reviewed and updated as needed; suspended where appropriate; new indicators created as needed. Program reviews completed timely and annual review of data.		x	
Effective Partnerships: The program has connections in place with business, non-profit organizations, governmental units, professional associations and education to support effective service delivery.		x	
Customer Service: Customers are satisfied with the range of programs and services provided and the manner in which they are delivered.	x		

Reflect on what has been accomplished, what is being developed and the documentation of processes:

Resource/ Staffing Review Assessment

Resource Allocation and Staffing assessment established.	 Highly Developed	 Emerging / Partially Developed	 Needs Developed
Resource Allocation: Human, physical and financial resources for programs and services are allocated on the basis of identified needs and are adequate to support the services and programs offered.			
Staff completes assigned work with acceptable quality within established timelines.	x		
Staff have access to sufficient physical resources to complete assigned work with acceptable quality within established timelines.		x	
Resources are allocated on the basis of identified needs, prioritized as part of the institutional budgeting process		x	
Financial resources are adequate to complete assigned work with acceptable quality within established timelines.			x
Reflect on what has been accomplished, what is being developed and the documentation of processes:			
Services and programs are staffed by qualified individuals whose academic preparation and/or experience are appropriate to their assignments. Assignments are clearly defined and published. The performance of personnel is regularly evaluated.			
Staff has appropriate educational credentials and/or experience for their assignments.	x		
Assignments are clearly defined and published, job descriptions current reflecting staff assignments	x		
Staff appropriately applies policies and procedures and completes assigned work with acceptable quality within established timelines.	x		
Staff participates in appropriate continuing education.	x		
Each employee participates in professional development activities appropriate to services provided such as:	x		

* Conferences and workshops * Classes and training * Listservs * Print and electronic publications * Professional associations.			
Each employee has a professional development plan.	x		
Reflect on what has been accomplished, what is being developed and the documentation of processes:			

Adapting and Adopting Open Educational Resources:
An Analysis of Student Cost Savings, Use, Performance, and Perception

By Mike T. Springer

Abstract

OER's are significant in terms of cost-savings to the student, but there are questions surrounding the quality of these resources, as well as whether students prefer OER or traditional textbooks. Many of the OER's available today are often peer-reviewed, but some platforms allow users to alter or customize the content, like OpenStax Connexions (CNX). When open content is altered or rearranged by an instructor, then it becomes essential for the instructor to determine whether those changes are beneficial or detrimental to student learning. Using the OpenStax Connexions (CNX) OER educational content repository and content management system, two customized OER's were developed and used as the only textbooks for two introductory chemistry courses at a community college in rural Oregon. The author of this study examined student performance, use, and perception. Student scores for the OER-only courses were compared with scores from courses taught with traditional textbooks. The results of a student's t-test suggest that there was a significant difference between scores, in favor of those taught with an OER textbook. Because of small sample sizes, Cohen's *d* was also calculated and indicated that, in most cases, the effect size was not large enough to be considered significant. Although it is difficult to say that learning was improved in light of the small effect sizes, it seems reasonable to suggest that learning was not adversely affected by the adoption of customized OERs. Lastly, an analysis of clickstream data from the learning management system and data obtained from an end of course survey seem to indicate that student usage and perception of OER does not differ significantly with traditional textbooks.

Keywords: Student perception, student performance, student usage, custom OER, OpenStax, OpenStax Connexions (CNX)

Introduction

Open Educational Resources

OERs are freely accessible, openly-licensed documents, images, and multimedia assets that are useful for teaching, learning, and assessing, as well as for research purposes.

OpenStax Connexions

Many authors who create customized OERs use *OpenStax Connexions* (CNX), an educational content repository and content management system. Created in 2012, OpenStax is a nonprofit educational initiative based at Rice University, and is supported by partnerships

with philanthropic foundations and educational resource companies. OpenStax provides peer-reviewed, open textbooks that are contributed freely by authors across the globe, and are also provided free to the end-user. The CNX platform offers users the ability to create, organize, and/or remix learning *modules* into *collections*, which can be offered as open textbooks. A learning module is similar to a section in a textbook; it is smaller than an entire chapter, but it is a complete, stand-alone lesson including content around a topic that can easily be remixed and used in different collections and contexts.

The present study utilized the CNX platform to remix several modules and create two open education resources that were offered as free, open textbooks for two different courses.

Traditional Textbooks vs. OERs

Traditional Textbooks: Pros and Cons

Pros. The content within traditional textbooks is generally thought to be of higher quality than OERs. Traditional textbooks are updated regularly and edited by a team of experts. This regular revision requires resources. Although the cost of this revision is passed on to students in the form of an expensive textbook, many rounds of revision does tend to remove the vast majority of factual errors and inadequacies of early editions that may have been missed initially. Not only are traditional textbooks being reviewed by their authors and editors, but also by the professors that adopt those resources for their classrooms. Although the same could be said of OERs, authors of OERs generally do not receive any type of compensation for their work and thus have little incentive to update or maintain their published materials. Not only do traditional textbook publishers employ authors and editors, they also employ professional photographers and can pay for copyrighted images. It is often difficult for authors of OERs to find high quality, copyright free images to include in their materials (Perez, 2017). OERs are freely available on the internet, but as such, require a device and an internet connection for access. At the very least, the OER must be initially downloaded (which requires an internet connection) and stored on a device for offline access. There are times when it may be difficult for a student to access the OER, such as when they do not have access to an internet connection or when the battery in their device has died. Traditional textbooks do not suffer from the same accessibility issues.

Cons. The cost of textbooks increased 82% between the years 2002 and 2012. (Student PIRGS, 2014), roughly three times the rate of inflation. Whether they choose to or not, higher educational faculty are often stuck using the latest editions of textbooks due to two primary reasons: 1) on average, a new edition of a textbook is released every 3.5 years (Ozdemir & Hendricks, 2017) and 2) publishers rarely offer previous editions. The National Association of College Stores indicates that 77 cents of every dollar spent on a new textbook goes directly to the publishers and at least 18 cents per dollar is pure profit. Meanwhile, a survey of 156 college instructors across more than 10 public colleges and universities in California and Oregon found that more than half of all faculty respondents indicated that the new editions of textbooks that they used were “rarely-to-never” justified, in terms of the difference in content between editions (Fairchild, 2004). The high cost of textbooks is often an obstacle for low-income students. A survey of 22,000 online students on the Florida Virtual Campus found that as many as 67% did not purchase a textbook at some point in their college career because of its exorbitant cost (Florida Virtual Campus, 2016).

One solution for addressing this financial barrier is for faculty to adopt, adapt, and / or develop OERs. However, in terms of quality and efficacy between traditional textbooks and OER textbooks (as perceived by faculty and students), OERs have been questioned in these categories. This has been an important issue, with many variables that the larger OER community continues to address with research.

OERs: Pros and Cons

Pros. One of the greatest advantages of OER textbooks is that they are free and/or can be printed cheaply at the college bookstore or at an office supply store, like FedEx or Staples. OERs can be used to supplement traditional textbooks to explore a content area that is tangential to the main content for little or no cost. OERs are more easily transported than traditional textbooks. Another decisive advantage that OERs offer over traditional textbooks is the capacity for multi-media components: it is relatively straightforward to add a video, song, or other animation into an OER that exists as a webpage or a PDF file. Further, active links to external websites and resources can easily be embedded in an OER for students to delve deeper into certain topics than the main text allows. Because OERs can easily be accessed with any device and internet connection, students have access to the learning materials at the very beginning of a course, rather than having to wait for financial aid to purchase expensive textbooks.

Cons. An important issue surrounding OER is in regard to the quality of the content. Certainly, students are excited about cheap or free course materials, but likely not at the cost of their own academic performance due to inferior textbooks. Some of the OER resources that are available have been authored and reviewed in processes that are similar to those of traditional publishers; *OpenStax* textbooks are a good example of this model. However, even resources from *OpenStax* can be altered or "customized" by adding, changing, or removing content. These "customized" OER textbooks do not require peer-review before they are used in the classroom. There are certainly advantages to using a customized OER textbook, like reordering topics or adding an example for context, but if the customizations are associated with lower scores than a traditional textbook, then the customized OER is a disservice to students.

This study seeks to investigate the amount of tuition costs that community college students save by enrolling in a course offering an OER versus a traditional textbook, whether using a customized OER textbook affects student scores by comparing student scores from courses taught with traditional textbooks to those taught with customized OER textbooks, and whether students prefer to use OERs or traditional textbooks.

Literature Review

Student Learning Outcomes

Several studies have investigated the extent to which student learning is affected by the use of an OER versus a traditional textbook. Robinson, et al (2014) investigated OER use in high school science courses in the Nebo School District in Utah and compared standardized exam scores between students that used an OER versus those that used a traditional textbook. They found that students in a chemistry course that utilized an OER scored significantly higher than those that utilized a traditional textbook, but they found no difference in student scores for earth science or physics courses that utilized an OER. These results suggest that OER use does not negatively affect student learning and, in some cases, might even improve student learning. This study compared the scores of 4,183 students taught by 43 teachers and even though the study controlled for possible differences due to individual teacher effects, it is possible that the effect observed was due to differences in teaching style, especially since teachers independently chose whether

to use the open textbooks. Another study compared 478 students using OERs to 448 students using traditional textbooks in a chemistry course at UC Davis (Allen, Guzman-Alvarez, Molinaro, Larsen, 2015). This study did not suffer from the possible confounding effects of individual teachers since both courses were taught by the same teacher and TA, and used the same exams,. Still, these researchers found no significant difference in student scores. A review by Hilton (2016) examined the results of 9 studies that pertained to student learning outcomes in courses taught with an OER versus those taught with a traditional textbook. Eight of these studies conclude that students perform as well or better in courses taught with an OER and the one study that connected OER use to lower student scores showed that these differences were not statistically significant. Hendricks, et al (2017) published a study investigating the use of OER in an introductory physics course at the University of British Columbia that enrolls between 800-900 students per year. There was no statistical difference in student scores on final exams between the section that utilized an OER in fall of 2016 and the previous three years of sections that utilized a traditional textbook. The general conclusion in all of these studies is that student learning does not seem to be negatively affected by use of an OER versus a traditional textbook.

Student Perception of the Quality of OER

Illowsky, et al (2016) examined student perceptions of OERs in a mathematics course at De Anza College, a community college in California. These researchers designed a multimedia textbook, *Collaborative Statistics* (first written in the mid-1990s), and the collaboration with Rice University that ensued was the beginning of what would later become the OpenStax Connexions (CNX) platform. After many revisions, Collaborative Statistics was renamed *Introductory Statistics* and it became the prototype for OpenStax College's open textbook model. Their analysis showed that students saved money and viewed the OER as a useful resource. Whether students purchased a hard copy of text or printed the pages, most students experienced significant cost savings. The study reported that 66% of the students said they used the textbook at least twice a week, similar to their use of other traditional textbooks. Survey results also found that students perceived OER favorably: 62% said the quality of the OER was equal to traditional textbooks, 25% said the quality of the OER was better, and 13% said the quality of the OER was worse. Bliss et al. (2013) investigated student and faculty perceptions of OER used in 8 community colleges across the United States. In all, 490 students and 58 faculty from 8 colleges responded to an online survey about OER in their classrooms. The majority of students and faculty had a positive experience using the open textbooks, appreciated lower costs, and thought quality was equal. Jhangiani, et al (2018) examined student perception of OERs at a large research university in Canada, Kwantlen Polytechnic University. This study revealed that the print format of the open textbook was rated significantly higher in quality than the commercial textbook and that the digital version of the open textbook was not significantly different than either. Their results showed that there was no dimension of the commercial textbook that was rated higher than either format of the open textbook.

Whether in a small community college or a large research university, most studies about OER perception seem to indicate that students perceive the quality of OERs to be at least as good as traditional textbooks, and even better, in some cases.

Purpose of the Study

The average college student in the United States spends $900 a year on textbooks (Allen, 2010). For students at some community colleges, this is nearly the same amount that they pay for tuition every year. It is important to examine ways to reduce this cost and OERs are a great potential solution. However, the

quality of the OER, in terms of whether it helps or hinders student learning, is paramount to this discussion. To examine this issue, this study compares student scores between courses taught with OERs versus those taught with traditional textbooks. It is also important to measure the students' perception of quality of OER textbooks offered in their college courses. Though students often cannot comment on the *accuracy* of the content, they can provide information about how often they used the material, whether they prefer the online format of the textbook, etc. Data regarding students' perception of OER materials can add a valuable perspective to the conversation.

Research Questions

In the present study, to examine any differences between courses taught with a traditional textbook and those taught with a customized OER textbook, the courses will be compared in terms of cost savings, students' performance on course assignments, students' use of course resources, and students' perception of the quality of open educational resources. The following research questions were addressed in the study:

1. What are the cost savings to students when an OER is used in place of a traditional textbook?

2. Do students use OER differently than they use traditional textbooks, in terms of their study habits?

3. Do students using an OER perform differently on course exams from students that use a traditional textbook?

4. Do students perceive OERs to be of similar quality to traditional textbooks?

Methods

This study was performed at a small, rural community college on the Oregon coast. This college utilizes the quarter system. Two courses were examined in this study during the 2016 and 2017 winter quarter (Table 1). CHEM 110 is a 1-quarter introduction to general, organic, and biological chemistry primarily for undergraduate health and nursing majors and GS 105 (General Science) is a 1-quarter introduction to general chemistry for undergraduate, non-science majors. In winter 2016, a traditional textbook was used, and in winter 2017, a customized OER textbook, created on the CNX platform, was used.

Table 1.
A Comparison of Traditional and a Customized OER Textbooks in Chemistry 110 and GS 105 During 2016 and 2017 Winter Quarters

	Traditional Textbook	Customized OER Textbook
CHEM 110	Winter 2016	Winter 2017
GS 105	Winter 2016	Winter 2017

OER Organization & Development

Creating a customized open textbook from the CNX platform (https://legacy.cnx.org/) begins with identifying which modules to use, how many modules to use, and in what order to place them. A module is a short lesson on one specific topic. Modules can be added together to create a "collection" or a "book". It is possible for authors to edit existing modules or to create their own. To limit the number of any unintentionally added errors in the development of the custom OER textbook, the present study did not add any original content or materials. The customized textbooks were created by selecting modules from

two peer-reviewed collections from the *OpenStax* library: *Chemistry (OpenStax College, 2016)* and *Biology (OpenStax College, 2016)*. A customized OER textbook was created for each course and was made available as a link on the LMS course portal, as well as in print through the bookstore. A course outline was created to align with the content of each course, then appropriate modules were chosen and arranged to support the course outline.

Two guiding principles were followed when organizing content for customized OERs: 1) to make each textbook no longer than eight chapters and 2) to craft a coherent narrative that is woven throughout the text to connect stand-alone chapters and topics. The OERs were designed for use in a 10-week quarter-system course. As such, it was decided that the maximum number of chapters should be kept to 8. Many traditional textbooks for these chemistry courses are designed for the semester system and, as such, have upwards of 15 chapters, which is unrealistic for a 10-week course. To reduce the number of chapters in the OER, similar chapters were combined into a single chapter, thereby retaining all of the content from the original course, simply packaged into more manageable chunks.

Modules are generally stand-alone units that can be reshuffled in many different ways depending on the curriculum. To adhere to guiding principle #2, an overarching theme of "*how molecular structure affects function*" was followed when determining which modules and topics to include, as well as how to organize them. This is a typical theme in chemistry and helps non-experts approach and understand chemical reactivity. To the greatest extent possible, it was decided that the book should tell a compelling story about nature that is connected throughout by the idea that chemical function is based on chemical structure. If a topic did not fit this story narrative, it was removed from the course outline. Because both courses are one-term, terminal courses (not part of a sequence), there was some freedom to modify the curriculum in this way. For example, unit 2 of the OER created for CHEM 110 contains the chapters: Cell Structure (chapter 5, Figure 1), Structure and Function of the Plasma Membrane (chapter 6), and Metabolism (chapter 7).

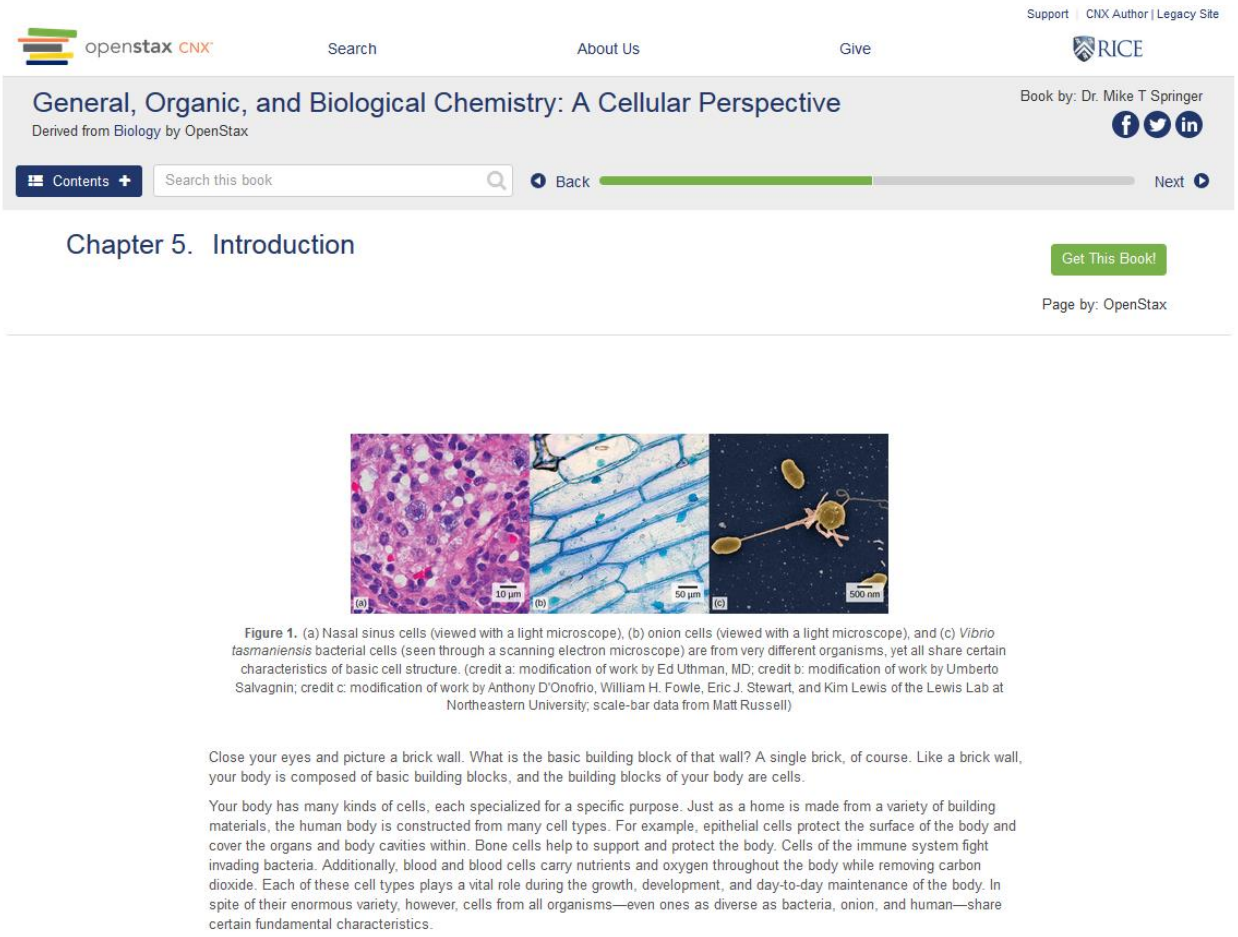


Figure 1. An example of a page from chapter 5 of the CHEM 110 OER: General, Organic, and Biological Chemistry: A Cellular Perspective.

Analysis

The ***student cost*** of traditional textbooks versus OER textbooks used for courses CHEM 110 and GS 105 was measured by…. To examine any differences between ***students' usage*** of course materials between the two types of textbooks, clickstream data collected automatically by the LMS were analyzed to compare the number of times each student clicked on each link on the LMS course page. Differences in ***student performance*** were measured by comparing scores on different types of assignments (homework, exams), as well as final course grade, in a course taught with a traditional textbook versus a course taught with a customized OER. A *t*-test was performed on the data to determine whether there was a statistically significant difference in student performance between the two courses. Because the number of students in each course was very small (between 15 and 30), the sample size was also small and the results of a *t*-test are of limited value by themselves. Therefore, the effect size was also determined by calculating Cohen's *d* (Cohen, 1977). The LMS automatically records these data. Students' perceptions of the quality of the customized OER versus traditional textbooks was assessed by administering an anonymous survey at the end of the term (provide the survey at the end of the paper).

Results

Demographic Data of the Student Population

The demographic information of the student population is shown in Table 2. These data were collected as responses to an anonymous survey (appendix A) administered at the end of the term. The survey questions used were developed by Bliss et al (Bliss, Robinson, Hilton, Wiley, 2013).

Table 2

Demographic data of students from courses with OER textbooks.

		CHEM 110	GS 105
Age	Under 18	2	2
	18 – 19	9	7
	19 – 20	3	5
	21 – 22	6	0
	23 – 25	0	1
	26 – 30	3	2
	30 – 35	3	0
Gender	Female	14	11
	Transgender	0	0
	Male	10	5
	Other / prefer not to say	0	0
Terms in College	1 – 2	13	5
	3 – 4	3	3
	5 – 6	4	2
	7 – 8	1	6
	9 – 10	1	0
	More than 10	2	0
Courses per Term	1 – 2	0	1
	3	2	3
	4	13	5
	5	7	5
	6	1	1
	7	0	0
	8 or more	1	1
Cumulative GPA	Less than 2.6	0	0
	2.6 – 3.0	8	3
	3.1 – 3.5	9	5
	3.6 – 4.0	4	8
	I don't know	3	0

The survey also collected responses about students' financial behavior with respect to loans and grants (Table 3) used to finance their education.

Table 3

Survey data of students' financial behavior.

		CHEM 110	GS 105
Have you received any loans to fund your education?	Yes	12	3
	No	12	13

Have you received any Pell Grants or Fee Waivers to fund your education?	Yes	18	6
	No	6	9

Students' Cost of Traditional Textbooks vs. OER Textbooks

What are the cost savings to students when an OER is used in place of a traditional textbook?

The amount of money that students saved because they did not have to purchase a traditional textbook is summarized in tables 4, 5, and 6. The dollar amounts in the table are the prices charged by the campus bookstore for each textbook. The traditional textbook used for CHEM 110 was "General, Organic, and Biological Chemistry", by Frost and Deal, 3rd edition (ISBN: 978-0134162003). This book was priced at $160.00 new from the campus bookstore. The CHEM 110 course typically enrolls between 30-40 students per term, an average of 35 students. As such, the amount of money that students spent on textbooks for this course was about $5600 per term. The traditional textbook used for GS 105 was "Introductory Chemistry, Essentials" by Tro, 5th edition (ISBN: 978-0321910295). This book costs $144.50 new from the campus bookstore. The GS 105 course typically enrolls between 18-24 students per term, with an average of 21 students. As such, the amount of money that students spent for textbooks in this course was about $3035 per term. Adapting and adopting an OER textbook saved students about $8635 during the 2016-2017 winter term.

Table 4

Cost of CHEM 110 and GS 105 traditional textbooks, number of students, and total cost for students during winter quarters 2016 and 2017

	New traditional textbook	**Number of Students**	**Amount per Course**
CHEM 110	$160.00	35	$5600.00
GS 105	$144.50	21	$3034.50
Total Cost to Students			***$8634.50***

Table 5

CHEM 110 and GS 105 OER textbooks, number of students, and cost savings for students during winter quarters 2016, 2017

	OER textbook	**Number of Students**	**Amount per Course**
CHEM 110	$0	35	$0
GS 105	$0	21	$0
Total Savings for Students			***$8634.50***

Table 6

Survey data of student's typical textbook purchasing behavior.

		CHEM 110	GS 105
How often do you purchase the required texts for the courses you take?	Never	0	0
	Rarely	3	4
	About half the time	3	1
	Often	7	8
	Always	11	3
How much do you typically spend on Textbooks each year?	Less than $100	1	1
	$101 - $200	1	2
	$201 - $300	4	3
	$301 - $400	6	6
	$401 - $500	6	3
	More than $500	6	1
Did you purchase any textbooks for this course?	Yes	6	4
	No	17	12
Were the textbooks used in this course available to you primarily online?	Yes	22	15
	No	1	1
If you did buy one or more textbooks for this course, how much did you spend?	Less than $20	6	4
	$21 - $40	3	4
	$81 - $100	2	0
	More than $100	0	1
Did you print the textbook for this course?	Yes	1	0
	No	22	15
If you did print the materials, then how much did you spend?	Less than $10	7	10
	More than $10	0	1

Students' Usage of Traditional Textbooks vs. OER Textbooks

Do students use OER differently than they use traditional textbooks, in terms of their study habits?

Figure 1 shows a screenshot of the appearance of the course portal to students. The number of times that students clicked on each link was recorded and reported in tables 7 and 8.

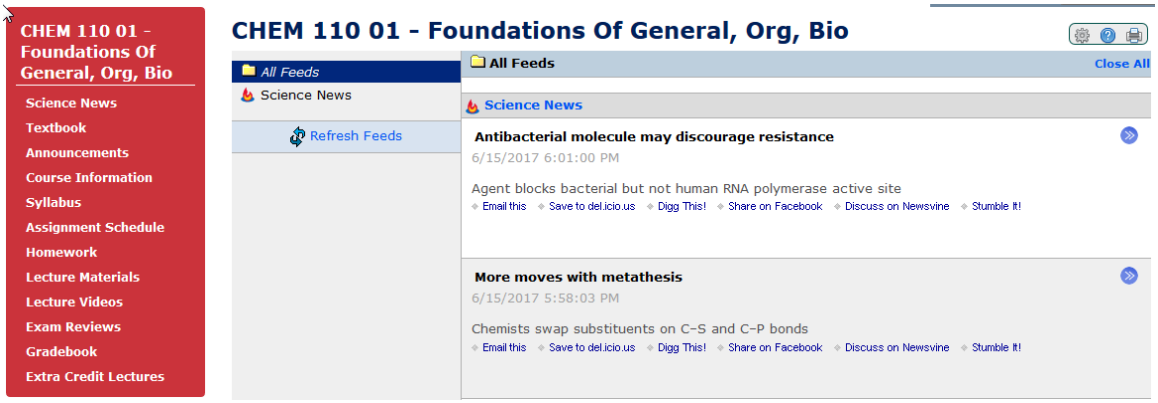


Figure 2. A screenshot of the learning management system webpage for *CHEM 110* in winter 2017.

The finished versions of the customized OER textbooks created CNX platform can be found here:

Link to customized OER for GS 105: https://legacy.cnx.org/content/col12103/latest/

Link to customized OER for CHEM 110: https://legacy.cnx.org/content/col12104/latest/

Both courses, GS 105 and CHEM 110, utilized the learning management system, *Jenzabar*. Clickstream data, the number of times that each link was clicked, were automatically recorded to determine how students used the portal, as shown in tables 7 and 8. Because a traditional textbook was used in winter 2016, there was not a link to the textbook included in the LMS portal.

Table 7

Clickstream data from the CHEM 110 learning management system course portal. The number of visitors and views is reported for each link, as well as the percentage of the total.

	Textbook		Gradebook		Lecture Materials		Total	
	Visitors	Views	Visitors	Views	Visitors	Views	Visitors	Views
Winter 2016 (N = 30)[b]	[a]	[a]	33	836 (18.2%)	27	170 (3.7%)	33[b]	4591
Winter 2017 (N = 32)[b]	26	73 (2.4%)	36	617 (20%)	29	251 (8.2%)	36[b]	3074

[a] A traditional textbook was used in winter 2016, so there wasn't a textbook link on the LMS page.

[b] Total student population (N) does not match the number of visitors because some students visited the portal before they dropped the course.

Table 8

Clickstream data from the GS 105 learning management system course portal. The number of visitors and views is reported for each link, as well as the percentage of the total.

	Textbook		Gradebook		Lecture Materials		Total	
	Visitors	Views	Visitors	Views	Visitors	Views	Visitors	Views
Winter 2016 (N = 18)	[a]	[a]	18	327 (16.7%)	14	87 (4.4%)	18	1959
Winter 2017 (N = 22)[b]	15	54 (3.8%)	24	376 (26.6%)	15	89 (6.3%)	24[b]	1414

[a] A traditional textbook was used in winter 2016, so there wasn't a textbook link on the LMS page.

[b] Total student population (N) does not match the number of visitors because some students visited the portal before they dropped the course.

In addition to collecting clickstream data about *actual* student use of course resources, survey questions collected data about students' *perceived* use of course resources, as reported in tables 9 and 10.

Table 9

Survey data of students' perceived use of course resources.

How often did you use the textbook this term?	Never	7	5
	2 – 3 times per term	4	4
	2 – 3 times per month	3	4
	2 – 3 times per week	8	3
	Everyday	0	0

Students' Performance Between Using Traditional Textbooks and OER Textbooks

Do students using an OER perform differently on course exams from students that use a traditional textbook?

To determine whether there were any significant differences in student performance between courses taught with a traditional textbook and those taught with an OER textbook, the mean score was calculated for a variety of assignments within each course. Table 5 shows the mean score for each type of assignment

in the GS 105 course, as well as the p-value from a student's t-test and Cohen's *d* to measure the effect size. The GS 105 course with a traditional textbook was taught during the winter term of 2016 and had 16 total students (*N* = 16). The GS 105 course with a customized OER was taught during the winter term of 2017 and had 22 total students (*N* = 22). Though most of the assignments in the course were kept the same between terms, the homework system was changed and each term was working with a different online homework system.

Table 10

Comparison of average student scores in two terms of GS 105. In one term, a traditional textbook was used and in the other, a customized open educational resource.

	Traditional Textbook (*N* = 16)	**Custom OER Textbook (*N* = 22)**	***p*-value**	**Cohen's *d***
Homework[a]	82.81	92.63	0.0002	0.516
Lab Worksheets	90.82	95.65	0.0019	0.422
Midterm Exams	73.24	80.32	0.0385	0.483
Final Exams	69.02	83.27	0.0031	1.126
Final Scores	81.58	91.63	0.0004	1.287

[a]The online homework program was changed from WT16 to WT17.

Table 11 shows the mean score for each type of assignment in the CHEM 110 course, as well as the p-value from a student's t-test and Cohen's *d* to measure the effect size. The CHEM 110 course with a traditional textbook was taught during the winter term of 2016 and had 30 total students (N = 30). The CHEM 110 course with a customized open educational resource was taught during the winter term of 2017 and had 24 total students (N = 24). Again, students in the course with a traditional textbook were using a different online homework system than the students in the course with a customized OER textbook.

Table 11

Comparison of average student scores in two terms of CHEM 110. In one term, a traditional textbook was used and in the other, a customized open educational resource.

	Traditional Textbook (N = 30)	**Custom OER Textbook (N = 32)**	**p-value**	**Cohen's *d***
Homework[a]	91.72	82.51	0.0001	0.807
Midterm Exams	71.58	78.01	0.0147	0.470
Final Exams	61.08	70.80	0.0155	0.699
Final Scores	81.44	81.13	0.9157	0.029

[a]The online homework program was changed from WT16 to WT17.

Students' Perceptions of Open Educational Resources vs Traditional Textbooks

Do students perceive OERs to be of similar quality to traditional textbooks?

In addition to demographic questions and questions about use of course resources, student survey responses about student's perceptions of the quality of the OER resources used in their courses and their preference for either online or traditional course materials (Table 11).

Table 12

Survey data of student's perception of OER textbook quality.

		CHEM 110	GS 105
How would you rate the quality of the textbook used for this course?	WORSE than texts in other courses	1	0
	SAME AS texts in other courses	18	10
	BETTER than texts in other courses	1	6
How do you feel about the online format of the textbook used for this course?	WORSE than texts in other courses	9	2
	SAME AS texts in other courses	7	8
	BETTER than texts in other courses	5	6
How likely are you to register for a future course with online textbooks like the one used in this course?	Very Unlikely	2	1
	Somewhat Unlikely	3	1
	Somewhat Likely	16	6
	Very Likely	1	8
Imagine a future course you are required to take. If two different sections of this course are offered by the same instructor during equally desirable time slots, but one section used OER texts similar to those used in this course and the other used traditional printed texts, which section would you prefer to enroll in?	Traditional Text	8	4
	OER Text	8	8
	No Preference	7	4

Limitations

Because of the limitations of this project, it is presented here as more of a case study than an experiment. First, the sample sizes were quite small, making statistical analysis difficult. To address the small sample size, Cohen's d was calculated and reported as a measurement of the effect size, but this, too, was quite small. As such, it is difficult to make any definitive conclusions based on statistical analysis. Second, although most of the modules used to remix the customized OERs were from OpenStax, a peer-reviewed resource, some of the modules were not. The author took care to review the modules included for accuracy, but this is not the same as a peer-review process and it is possible that the OERs created contained factual errors. Although assessing the *factual content* of a customized OER is certainly a vital process, it is beyond the scope of this paper; determinations about factual accuracy should be left to the content experts by using a peer-review process. Finally, although care was taken to present the same lecture material and use the same assignments in courses taught with OERs and with traditional textbooks, the online homework system was changed between 2016 and 2017, so it is difficult to make any conclusions about differences in homework scores.

Discussion and Conclusions

The most uncontroversial benefit of adopting an OER textbook was the cost savings to students. Textbooks costs continue to increase, and the number of students wishing to obtain a credential and that are unable to pay for tuition and course materials is also increasing. The average amount of student debt of 2016 college graduates was $37,172 per student (https://www.debt.org/students/).

Of course, it comes as no surprise that OER textbooks are cheaper than traditional textbooks. The real question is whether students are equally able to learn with them, as well as whether they are equally satisfied with them. The results of this study suggest that this is the case, though confounding variables prevent definitive conclusions from being drawn. Although care was taken to ensure that assignments between the two courses were consistent, if it was determined that a change in assignments between the two terms would be beneficial to student learning, then it was made. Therefore it is likely that the two courses were similar, but it is probable that slightly different material was covered and with slightly different delivery. In addition, not only was the textbook changed between sections, but so too was the homework system. This change alone is enough to cast doubt on any inferred cause of a statistically significant difference between the two sections.

Tables 5 and 6 report the results of student performance on a variety of course assignments, but it is important to note that any observed difference in scores between the two sections could be the result of a difference in the abilities of the students in each group before the course began. Since a pretest was not administered to the students in either section before the course began, it is not possible to determine any differences in the academic abilities or previous knowledge between the two groups. The p-values shown in table 5 and table 6 suggest that there are some significant differences between the scores of the students taught with a traditional textbook versus those taught with a customized open educational resource.

The data seem to suggest that student learning is significantly improved when the course is taught with a customized OER. However, as mentioned above, there are many reasons to be dubious of such a conclusion. The Cohen's *d* statistic provides a measure of the effect size. Typically, an effect size of less than 0.8 indicates that the size of the effect is not large enough to be significant. For many of the p-values reported in tables 5 and 6 that signify statistical difference, the associated values of Cohen's *d* are small. The smaller the effect, the more difficult it is to determine its cause, especially in an educational environment like a classroom, where there are often many variables. That the two courses were taught by the same instructor during the same term (winter) does limit the number of differences in the delivery of the two courses, as well as the type of students that might enroll in a winter term course. However, it is likely that there were enough differences to cast doubt on whether any observed effect was due to the experimental treatment or to some unintentional difference in delivery or student population.

Tables 7 and 8 report the clickstream data of students, the number of times that they clicked each link on the LMS portal seen in figure 1. There were not any significant differences in student use of course resources between students enrolled in a course with a traditional textbook and those enrolled in a course with an OER textbook. The most notable result from this analysis is that not only did the "textbook" link receive the smallest number of clicks in both courses, there were a surprising number of students that never even clicked the textbook link at all! The survey data are consistent with the clickstream data as regards the use of the textbook: in CHEM 110, 6 students did not click the textbook link (table 7) and 7 students reported that they never used the textbook (table 10) and in GS 105, 7 students did not click the textbook link (table 8) and 5 students reported that they never used the textbook (table 10). The number of students that use the textbook in any given course is not likely to be 100%, but the number of students

that never even clicked the link once was truly shocking to this instructor. Of course, the link provided on the LMS course portal was not the only way to access the textbook and students might have been accessing it another way, like through *Google* or the *OpenStax* website.

The most viewed link was the "gradebook", another result that is not particularly surprising. Students have always likely been slightly obsessed with grades, but modern technology allows students to monitor their grades in real-time, so this obsession may have become stronger. The "gradebook" link was the only link that was actually viewed by every student. Another comparison of note is the large difference between clicks on the "textbook" link and clicks on the "lecture materials" link. The "lecture materials" link is where the instructor posts PowerPoint slides and recorded .mp3 files containing audio of each lecture and the notes the instructor made on the board during the lecture. At first glance, it seemed as though, if students were not using the textbook, then perhaps there was a large number that were not studying. However, it is possible that some students found the PowerPoint slides and lecture notes more useful than the textbook. Although neither the "textbook" link nor the "lecture materials" link were clicked by every student, it is at least conceivable that about half of the students used the textbook to study and the other half used the recorded lectures.

Tables 9 and 10 report survey data collected about student use. Although the clickstream data suggest there were a number of students that never clicked the textbook link once, table 9 shows that there were 0 students that reported "never purchasing the textbook." Are students purchasing textbooks that they don't use? Indeed, several students report that they "never used the textbook" and 0 students reported that they "used the textbook every day." Further, although a cheap option was provided to students to print the textbook at the college bookstore, only 1 student actually elected to print the textbook. These data suggest that students may feel obligated to purchase textbooks that they may not even intend to use, with most students spending hundreds of dollars per year.

A vast majority of students reported that the quality of the customized OER textbook used in their course was "the same as" the quality of textbooks used in other courses (table 11) – although, since it seems that many of them may never have even looked at the textbook, this doesn't mean much. Students are more divided about whether they prefer the online format or the traditional format or a textbook, with nearly half of the students in CHEM 110 reporting that they felt the online format was "worse" than in other courses. Some of the open-ended responses from the survey cited the very long time that it takes to load the customized OER after clicking the link as one reason that they did not prefer that format. Students were told, however, that they could download a .pdf of the textbook that would load much faster. A clear majority of students indicated that they either preferred the course with an OER textbook to traditional courses or they had no preference, although about a third of students indicated that they preferred the traditional course format.

These results suggest that student learning outcomes were not negatively affected by the use of OER. Although the current study is too limited in duration and sample size to provide any definitive determination about student learning, the results indicate that students are not, in most cases, averse to taking a course with an OER textbook and, in some cases, they would even prefer it.

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SOUTHWESTERN OREGON COMMUNITY COLLEGE

Psychology (AA/OT)

Transfer University: Oregon State University for Psychology

Requirements	Courses	Credits
Foundational All courses must be completed with a grade of 'C' or better		
Writing WR121 and WR122 Note: Information Literacy is included through embedding the appropriate content in courses that count toward the writing Foundational Requirement.	WR 121 (4) WR 122 (4)	8
Communication One (1) course form SP100, SP111, SP218, or SP219	SP 100, 111, 218, or 219 (3)	3
Mathematics One (1) course from: MTH105 with a prerequisite of MTH 98 or MTH111 or higher with a prerequisite of MTH 95, excluding MTH 211	MTH 105 or 111 (4)	4
Health, Wellness and Fitness PE185 (3 courses) or one (1) three credit course from HE250 or PE231	PE 185 (3 times 1 credit), HE 250 or PE 231	3
Discipline Studies All courses must be completed with a grade of 'C' or better.		
Arts and Letters. Three (3) courses chosen from two (2) or more disciplines. Note: A second year foreign language may be included, but not first year.	PHL 103 (if you did not take WR 227) req'd *CHOOSE TWO: art, foreign language, English, humanities, music, speech, theater, writing, 1 more from philosophy	9
Social Science Four (4) courses chosen from two (2) or more disciplines	PSY 201 (3) PSY 202 (3 cr. recommended, elective at OSU) PSY 203 (3) *CHOOSE ONE: anthropology, criminal justice, economics, education, geography, Human Development and Family Studies, history, political science, sociology	12
Science/Mathematics/Computer Science Four (4) courses from at least two (2) disciplines including at least three (3) laboratory course in biological and/or physical science.	BI 101 (4 recommended, elective at OSU) BI 102 (4) BI 103 (4) *CHOOSE ONE: chemistry, environmental science, geology, general science, physics, computer science, math	16
Cultural Literacy Students must select one course from any of the discipline studies that is designated as meeting the statewide criteria for cultural literacy.	CHOOSE ONE: ANTH 221, 222, 223, 224, 230, 231, 232, ED 258, ENG, 107,108,109, GEOG 105, HDFS 140, HUM 204, 205, 206, HST 104, MUS 205, 206, PSY 216, 231, SOC 208, 210, 213 WS 101	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Psychology (AA/OT)

Transfer University: Oregon State University for Psychology

Electives All courses must be completed with a grade of 'C' or better.		
Electives	**CHOOSE any classes of interest in psychology or other areas**	35
Total		90

REQ'S FOR OSU PSYCHOLOGY: AA/OT AND THE FOLLOWING CLASSES

SOCC's classes:	**OSU Equivalent Classes:**
PSY 201, 203*	**PSY 201, 202**
BI 102 and 103**	**BI 102, 103**
PHL 103 or WR 227***	**PHL 121 or WR 327**

*PSY 202 is considered a lower division transfer class (elective)
** OSU teaches their biology content in a different sequence. While the articulation tables equate to OSU BIO 102 at Southwestern's BI 102, the content within OSU's BIO 102 is actually BI 101 (genetics and evolution). A course petition may be submitted at OSU if BI 101 is taken at Southwestern for entry into the Psychology program.
***WR 227 can be used for OSU's upper division (300-400) class WR 327

Program Outcomes

- Demonstrate knowledge of the theoretical and conceptual frameworks of a particular Social Science.
- Utilize Social Science approaches, such as research methods, inquiry, or problem solving, to examine the variety of perspectives about human experiences.
- Develop an understanding and appreciation of similarities, differences, and changes over time among and between individuals, groups, and societies as they shape and are shaped by history, culture, institutions, and ideas.

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Psychology (AA/OT)

Transfer University: Oregon State University for Psychology

Degree: Psychology (AAOT)

Transfer University: Oregon State University

TERM 1			
Course #	**Course Title**	**Credits**	**Notes**
WR 121	English Composition	4	
PSY 201	General Psychology	3	
	Social Science (not PSY)	3	
	Elective (can be PSY or other subject)	3	
	Elective (can be PSY or other subject)	3	
	Total Credits	**16**	

TERM 2			
Course #	**Course Title**	**Credits**	**Notes**
WR 122	English Composition	4	
PSY 202	General Psychology	3	
*PE 185	Physical Education	1	
	Elective (can be PSY or other subject)	3	
	Elective (can be PSY or other subject)	3	
*** If you decide to do HE 250 or PE 231, no need to do PE 185's** **Total Credits**		**14**	

TERM 3			
Course #	**Course Title**	**Credits**	**Notes**
MTH 105 OR 111	Contemporary Math or Coll. Algebra	4	
PSY 203	General Psychology	3	
PE 185	Physical Education	1	
PHL 103/WR 227	Logic and Crit. Think./Report Wr.	3	
	Non-lab Science, comp science or math (not MTH 105 or 111)	4	
	Total Credits	**15**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Psychology (AA/OT)

Transfer University: Oregon State University for Psychology

TERM 4			
Course #	**Course Title**	**Credits**	**Notes**
BI 101	General Biology	4	
	Arts and Letters	3	
	Social Science (not PSY)	3	
	Elective (can be PSY or other subject)	3	
	Elective (can be PSY or other subject)	3	
	Total Credits	**16**	

TERM 5			
Course #	**Course Title**	**Credits**	**Notes**
BI 102	General Biology	4	
	Arts and Letters (not PHL if chosen twice already)	3	
	Cultural Literacy	3	
	Elective (can be PSY or other subject)	3	
	Elective(s)	2	
	Total Credits	**15**	

TERM 6			
Course #	**Course Title**	**Credits**	**Notes**
BI 103	General Biology	4	
PE 185	Physical Education	1	
SP 100,111, 218,219	Speech	3	
	Elective (can be PSY or other subject)	3	
	Elective (can be PSY or other subject)	3	
	Total Credits	**14**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Biology (AA/OT)

Transfer University:

Associate of Arts/Oregon Transfer (AA/OT)		
Requirements	**Courses**	**Credits**
Foundational All courses must be completed with a grade of 'C' or better		
Writing Three (3) courses from WR121, WR122, WR 123, or WR227 Note: Information Literacy is included through embedding the appropriate content in courses that count toward the writing Foundational Requirement.	WR 121 (3) WR 122 (3) WR 123 (3) or WR 227 (3)	9
Communication One (1) course form SP100, SP111, SP218, or SP219	SP 111 (3)	3
Mathematics One (1) course from: MTH105 with a prerequisite of MTH 98 or MTH111 or higher with a prerequisite of MTH 95, excluding MTH 211	MTH 111 (4) MTH 112 (4)	8
Health, Wellness and Fitness PE185 (3 courses) or one (1) three credit course from HE250 or PE231	PE 231 (3)	3
Discipline Studies All courses must be completed with a grade of 'C' or better.		
Arts and Letters. Three (3) courses chosen from two (2) or more disciplines. Note: A second year foreign language may be included, but not first year.	ENG 204 (3) ENG 205 (3)' PHL 102 (3)	9
Social Science Four (4) courses chosen from two (2) or more disciplines	ECON 201 (4) ECON 202 (4) SOC 206 (3)	12
Science/Mathematics/Computer Science Four (4) courses from at least two (2) disciplines including at least three (3) laboratory course in biological and/or physical science.	BI 201 (4) BI 202 (4) BI 203 (4) CHEM 221 (5)	17
Cultural Literacy Students must select one course from any of the discipline studies that is designated as meeting the statewide criteria for cultural literacy.	ANTH 232 (3)	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Biology (AA/OT)

Program Required Courses		
Science	BI 201 (4) BI 202 (4) BI 203 (4) CHEM 221 (5) CHEM 222 (5) CHEM 223 (5) PH 211 (5) PH 212 (5) PH 213) (5)	
Math	MTH 111 (4) MTH 112 (4) MTH 251 (4) MTH 252 (4) .	
Electives All courses must be completed with a grade of 'C' or better.		
Electives CIS 120 (4)		
Total		90

Prerequisites

Program Outcomes

- Apply foundational knowledge and models of a natural or physical science to analyze and/or predict phenomena.
- Understand the scientific method and apply scientific reasoning to critically evaluate arguments.
- Interpret and communicate scientific information via written, spoken, and/or visual representations.
- Describe the relevance of specific scientific principles to the human experience.
- Form and test a hypothesis in the laboratory or field using discipline-specific tools and techniques for data collection and/or analysis.

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Biology (AA/OT)

Degree: Biology

Transfer University:

TERM 1			
Course #	**Course Title**	**Credits**	**Notes**
WR 121	English Composition	3	
SP 111	Fundamentals of Public Speaking	3	
BI 201	Introductory Biology	4	
ENG 204	Survey of English Literature	3	
PE 231	Wellness for Life	3	
	Total Credits	**16**	

TERM 2			
Course #	**Course Title**	**Credits**	**Notes**
WR 122	English Composition	3	
MTH 111	College Algebra	4	
BI 202	Introductory Biology	4	
ECON 201	Microeconomics	4	
ENG 205	Survey of English Literature	3	
	Total Credits	**18**	

TERM 3			
Course #	**Course Title**	**Credits**	**Notes**
WR 123 or WR 227	English Composition or Report Writing	3	
BI 203	Introductory Biology	4	
ECON 202	Macroeconomics	4	
MTH 112	Trigonometry	4	
.			
	Total Credits	**15**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Biology (AA/OT)

TERM 4			
Course #	**Course Title**	**Credits**	**Notes**
PH 211	General Physics w/Calculus I	5	
MTH 251	Calculus I Differential Calculus	4	
CHEM221	General Chemistry I	5	
CIS 120	Concepts of Computing	4	
	Total Credits	**18**	

TERM 5			
Course #	**Course Title**	**Credits**	**Notes**
PH 212	General Physics w/Calculus II	5	
MTH 252	Calculus II Integral Calculus	4	
CHEM222	General Chemistry II	5	
PHL 101	Introduction to Philosophy	3	
	Total Credits	**17**	

TERM 6			
Course #	**Course Title**	**Credits**	**Notes**
ANTH 232	Native North Americans	3	
PH 213	General Physics w/Calculus	5	
CHEM 223	General Chemistry III	5	
SOC 206	Social Problems and Issues	3	
	Total Credits	**16**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

English (AA/OT)

Transfer University:

Associate of Arts/Oregon Transfer (AA/OT)		
Requirements	**Courses**	**Credits**
Foundational All courses must be completed with a grade of 'C' or better		
Writing Three (3) courses from WR121, WR122, WR 123, or WR227 Note: Information Literacy is included through embedding the appropriate content in courses that count toward the writing Foundational Requirement.	WR 121 (3) WR 122 (3) WR 123 (3)	9
Communication One (1) course form SP100, SP111, SP218, or SP219	SP 111 (3)	3
Mathematics One (1) course from: MTH105 with a prerequisite of MTH 98 or MTH111 or higher with a prerequisite of MTH 95, excluding MTH 211	MTH 105 (4) or MTH 111 (4)	4
Health, Wellness and Fitness PE185 (3 courses) or one (1) three credit course from HE250 or PE231	HE 250 (3)	3
Discipline Studies All courses must be completed with a grade of 'C' or better.		
Arts and Letters. Three (3) courses chosen from two (2) or more disciplines. Note: A second year foreign language may be included, but not first year.	HUM 204 (3) ART 206 (3) ENG 104 (3)	9
Social Science Four (4) courses chosen from two (2) or more disciplines	PSY 100 (3) SOC 204 (3) SOC 218 (3) HST 101 (3)	12
Science/Mathematics/Computer Science Four (4) courses from at least two (2) disciplines including at least three (3) laboratory course in biological and/or physical science.	BI 101 (4) BI 102 (4) BI 103 (4) General Science (4)	16
Cultural Literacy Students must select one course from any of the discipline studies that is designated as meeting the statewide criteria for cultural literacy.	ENG 107(3)	3

SOUTHWESTERN OREGON COMMUNITY COLLEGE

English (AA/OT)

Program Required Courses		
ENG 20x American or British ENG 20x American or British ENG 20x American or British ENG 299 WR 241, WR 242, or WR 243		
Electives All courses must be completed with a grade of 'C' or better.		
ENG 104 ENG 105 ENG 106 ENG 107 ENG 108 ENG 109 ENG 201 ENG 145		
Total		

Prerequisites

Program Outcomes

- Distinguish and apply terminologies, methodologies, processes, epistemologies, and traditions specific to the discipline.
- Perceive and understand the formal, conceptual, and technical elements specific to the discipline.
- Analyze, evaluate, and interpret texts, objects, events, or ideas in the cultural, intellectual, or historical contexts.
- Interpret artistic and/or humanistic works through the creation of art or performance.
- Develop critical perspectives or arguments about the subject matter, grounded in evidence-based analysis.
- Demonstrate self-refection, intellectual elasticity, widened perspective, and respect for diverse viewpoints.

SOUTHWESTERN OREGON COMMUNITY COLLEGE

English (AA/OT)

Degree: English (AAOT)

Transfer University:

TERM 1			
Course #	**Course Title**	**Credits**	**Notes**
WR 121	English Composition	3	
ENG 104	Introduction to Literature: Fiction	3	
ENG 107	World Literature	3	
HE 250	Personal Health	3	
BI 101	General Biology	4	
	Total Credits	**16**	

TERM 2			
Course #	**Course Title**	**Credits**	**Notes**
WR 122	English Composition	3	
ENG 105	Introduction to Literature: Drama	3	
ENG 108	World Literature	3	
SP 111	Fundamentals of Public Speaking	3	
BI 102	General Biology	4	
	Total Credits	**16**	

TERM 3			
Course #	**Course Title**	**Credits**	**Notes**
WR 123	English Composition	3	
ENG 106	Introduction to Literature: Poetry	3	
ENG 109	World Literature	3	
MTH 105	Math in Society	4	
BI 103	General Biology	4	
	Total Credits	**17**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

English (AA/OT)

TERM 4			
Course #	**Course Title**	**Credits**	**Notes**
HST 101	History of Western Civilization	3	
HUM 204	World Myth and Religion	3	
GS	General Sciences	4	GS104-108
ENG 200	Literature: British or American	3	
ENG 200	Elective	3	
	Total Credits	**16**	

TERM 5			
Course #	**Course Title**	**Credits**	**Notes**
WS 101	Women/Gender Studies	3	
WR 240	Imaginative Creative Writing	3	WR241-243
SOC 204	Introduction to Sociology	3	
ENG 200	Lit: British or American	3	
ENG 299	Special Topics in Literature	3	
	Total Credits	**15**	

TERM 6			
Course #	**Course Title**	**Credits**	**Notes**
PSY 100	Introducti to Psychology	3	
ENG 201	Shakespeare	3	
ENG 145	Shakespeare Field Trip	1	
ART 206	History of Western Art	3	
ENG 200	Lit: British or American	3	
ENG 200	Elective	3	
	Total Credits	**16**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Accounting (AAS)

Transfer University:

Associate of Applied Science Degree (AAS)		
Requirements	**Courses**	**Credits**
Related Instruction Courses must be selected from the approved list of Related Instruction (General Education) courses. All Related Instruction (General Education) courses must be completed with a grade of 'C' or better.		
Writing Three (3) credit hours at a level equivalent to WR115 or higher	WR 115	3
Communication Three (3) credit hours at a level equivalent to SP100 or higher	SP 219	3
Computation Three to four (3-4) credit hours at a level equivalent to MTH60 or higher.	MTH 82	4
Human Relations Three (3) credit hours or as specified in the AAS degree program.	BA 120	3
Health, Wellness and Fitness PE185 (3 courses) or one (1) three credit course from HE250 or PE231	PE 231	3
Digital Literacy Four (4) credit hours CIS120	CIS 120	4
Program Required Courses		
BA 101 (4) BA 120 (3) BA 177 (3) BA 205 (4) BA 206 (3) BA 211 (4) BA 212 (4) BA 213 (4) BA 217 (3) BA 220 (3) BA 222 (3) BA 230 (3) BA 240 (3) BA 277 or PHL 102 (3) BA 280 (1)	AC 280 (4) CIS 125S (3) CIS 125W (3) CIS 120 (4) ECON 201 (4) ECON 202 (4)	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Accounting (AAS)

Electives		
CS160 (4) BA223 (4)	Any CS/CIS, BA, AC course note required for the degree; OA 121 Beginning Keyboarding, OA 124 Keyboard Skill Building, OA 220 Electronic Calculators; MTH 65 Algebra II, MTH 95 Intermediate Algebra, or higher; WR 227 Report Writing	
Total		

Prerequisites

CIS 90 (2) Computer Basics (or demonstrate proficiency)
MTH 20 (4) Basic Mathematics (or placement in higher math course)
WR 90R (4) Academic Literacy (or placement in higher writing course)

Program Outcomes

- Communicate effectively in oral and written forms in business environment.
- Practice within the legal and ethical frameworks of a given business or industry.
- Participate in learning opportunities that contribute to personal and professional growth.
- Adequately identify and record business transactions.
- Verify accuracy of accounting data.
- Make basic decisions regarding accounting functions.
- Produce basic financial statements (e.g. balance sheets, income statements, cash flows).
- Prepare budgets, payroll, and other quarterly tax reports.
- Communicate effectively with tax and accounting professionals.
- Effectively and efficiently use current and emerging technologies and software to solve workplace problems.
- Interact effectively with coworkers in ways that contribute to the organization's goals and your advancement in business opportunities.

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Accounting (AAS)

Degree:

Transfer University:

TERM 1			
Course #	**Course Title**	**Credits**	**Notes**
BA 101	Introduction to Business	4	
BA 211	Principles of Accounting I	4	
BA 284	Job Readiness	1	
CIS 120	Concepts of Computing	4	
WR 115	Introduction to Expository Writing	3	
	Total Credits	**16**	

TERM 2			
Course #	**Course Title**	**Credits**	**Notes**
BA 120	Leadership Development	3	
BA 212	Principles of Accounting II	4	
BA 222	Finance	3	
CIS 125S	Spreadsheet Applications	3	
MTH 82	Business Mathematics	4	
	Total Credits	**17**	

TERM 3			
Course #	**Course Title**	**Credits**	**Notes**
BA 206	Management Fundamentals	3	
BA 213	Principles of Accounting III Managerial Accounting	4	
BA 217	Accounting Process	3	
BA 240	Fund Accounting Governmental	3	
SP 219	Small Group Discussion	3	
	Total Credits	**16**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Accounting (AAS)

TERM 4			
Course #	**Course Title**	**Credits**	**Notes**
BA 230	Business Law	4	
ECON201	Microeconomics	4	
CIS125W	Word Processing Applications Microsoft	3	
CS160	Computer Science Orientation	4	Any CS/CIS, BA, AC course note required for the degree; OA 121 Beginning Keyboarding, OA 124 Keyboard Skill Building, OA 220 Electronic Calculators; MTH 65 Algebra II, MTH 95 Intermediate Algebra, or higher; WR 227 Report Writing
	Total Credits	**15**	

TERM 5			
Course #	**Course Title**	**Credits**	**Notes**
BA 205	Solving Communication Problems with Technology	4	
BA 220	Tax Accounting Personal Income Tax	3	
ECON202	Macroeconomics	4	
BA 223	Principles of Marketing	3	Any CS/CIS, BA, AC course note required for the degree; OA 121 Beginning Keyboarding, OA 124 Keyboard Skill Building, OA 220 Electronic Calculators; MTH 65 Algebra II, MTH 95 Intermediate Algebra, or higher; WR 227 Report Writing
	Total Credits	**14**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Accounting (AAS)

TERM 6			
Course #	**Course Title**	**Credits**	**Notes**
BA 177	Payroll Records and Accounting	3	
BA 277or PHL 102	Business Ethics or Ethics	3	
AC 280	CWE: Accounting	4	
PE 231	Wellness for Life	3	
	Specific Elective	3	
	Total Credits	**16**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Baking and Pastry Arts (AAS)

Transfer University:

Associate of Applied Science Degree (AAS)		
Requirements	**Courses**	**Credits**
Related Instruction Courses must be selected from the approved list of Related Instruction (General Education) courses. All Related Instruction (General Education) courses must be completed with a grade of 'C' or better.		
Writing Three (3) credit hours at a level equivalent to WR115 or higher	WR 115	3
Communication Three (3) credit hours at a level equivalent to SP100 or higher	CRT2039	3
Computation Three to four (3-4) credit hours at a level equivalent to MTH60 or higher.	MTH 81	4
Human Relations Three (3) credit hours or as specified in the AAS degree program.		
Health, Wellness and Fitness PE185 (3 courses) or one (1) three credit course from HE250 or PE231	HE 250	3
Digital Literacy Four (4) credit hours CIS120	CIS 120	4
Program Required Courses		
CRT2007 (1) CRT2015 (3) CRT2016 (3) CRT2017 (3) CRT2018 (1) CRT2024 (3) CRT2026 (1) CRT2027 (1) CRT2028 (1) CRT2030 (3) CRT2031 (6)	CRT2032 (7) CRT2033 (4) CRT2034 (2) CRT2037 (6) CRT2038 (1) CRT2039 (3) CRT2040 (6) CRT2042 (3) CRT2045 (7) CRT280B2 (12)	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Baking and Pastry Arts (AAS)

Electives		
Total		

Prerequisites

CIS 90 (2) Computer Basics (or demonstrate proficiency)
MTH 20 (4) Basic Mathematics (or placement in higher math course)
WR 90R (4) Academic Literacy (or placement in higher writing course)

Program Outcomes

- Prepare a variety of pasty products to include pies, tart, pate a choux, crepes, puff pastry, and filo dough.
- Identify, select, and demonstrate the use of various chocolates and sugar and the common uses for the decoration processes.
- List and explain the application of mixes and other convenience products pertaining to the baking process.
- Utilize concept of cost control, purchasing, receiving, quality standards, profit, and staffing costs.
- Describe and apply the principles of nutrition to maximize nutrient retention in baking preparation.
- Demonstrate supervisory skills and abilities utilizing critical-thinking skills.
- Obtain ServSafe Certification.

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Baking and Pastry Arts (AAS)

Degree:

Transfer University:

TERM 1			
Course #	**Course Title**	**Credits**	**Notes**
CRT2015	Sanitation and Safety for Managers	3	
CRT 2031	Bakery and Pastry Fundamentals	6	
CRT2032	Baking and Pastry Fundamentals II	7	
CRT2039	Prof Pres for the Culinary Wrkfrc	3	
MTH81	Applied Mathematics for Culinary Arts	4	
	Total Credits	**23**	

TERM 2			
Course #	**Course Title**	**Credits**	**Notes**
CRT2016	Culinary Nutrition	3	
CRT 2027	Introduction to Sugar	1	
CRT2028	Basic Chocolate	1	
CRT2033	Classic and Contemporary Cakes	4	
CRT 2040	Culinary Arts for Baking and Pastry	6	
CIS 120	Concepts of Computing	4	
	Total Credits	**19**	

TERM 3			
Course #	**Course Title**	**Credits**	**Notes**
CRT2007	Inventory Control and Purchasing	1	
CRT 2017	Restaurant Management Supervision	3	
CRT2018	Culinary Arts Career Planning	1	
CRT2024	Frozen Desserts	3	
CRT2026	Dessert Menu Development	1	
CRT2030	Bakery Design	3	
CRT2045	Retail Baking	7	
WR115	Introduction to Expository Writing	3	
	Total Credits	**22**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Baking and Pastry Arts (AAS)

TERM 4			
Course #	**Course Title**	**Credits**	**Notes**
CRT2034	Advanced Sugar and Chocolate	2	
CRT2037	Plated Desserts	6	
CRT2042	Wedding Cakes	3	
CRT 2038	Applied Visual Principles	3	
HE 250	Personal Health	3	
	Total Credits	**15**	

TERM 5			
Course #	**Course Title**	**Credits**	**Notes**
CRT280B2	CWE:Baking and Pastry Arts	12	
	Total Credits	**12**	

TERM 6			
Course #	**Course Title**	**Credits**	**Notes**

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Criminal Justice PSU (AS)

Transfer University: Portland State University

Associate of Science Degree (AS)		
Requirements	**Courses**	**Credits**
General Education All courses must be completed with a grade of 'C' or better		
Writing Six (6) credit hours at a level equivalent to WR121, WR122, or WR227	WR 121, WR 122	6
Communication One (1) course taken from SP100, SP111, SP218, or SP219	SP 111	3
Mathematics Four (4) credit hours of college level mathematics from MTH105 or higher, excluding MTH211	MTH 105	4
Health, Wellness and Fitness PE185 (3 courses) or one (1) three credit course from HE250 or PE231	3 PE 185 courses	3
Distribution Courses must be at least (3) credits each and complete six (6) credits from each of the following Related Area of Instruction Requirements. All courses must be completed with a grade of 'C' or better		
Arts and Letters Six (6) credit hours. Note: A second year foreign language may be included, but not first year.	ENG 105, ENG 106	6
Social Science Six (6) credit hours	SOC 204, SOC 205,	6
Science/Mathematics/Computer Science Six (6) credit hours	BI 101, BI 102	8

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Criminal Justice PSU (AS)

Program Required Courses		
CJ 100 (3) CJ101 (4) CJ110 (4) CJ130 (4) CJ162 (1) CJ220 (4) CJ222 (4) CJ247 (3)		
Electives		
None		
Total		

Prerequisites

CIS 090 – Computer Basics (or demonstrate proficiency)
MTH 95 – Intermediate Algebra (or placement in higher math course)
WR 90R – Academic Literacy (or placement in higher writing course)

Program Outcomes

- Identify the characteristics of professional integrity and ethical standards for Oregon criminal justice professionals.
- Describe and relate the constitutional rights and responsibilities of citizens, offenders, and victims as they apply to state, federal, and procedural laws.
- Describe the processes and technology used to gather, investigate, manage, and report information in the criminal justice field.
- Identify the legal responsibilities of criminal justice professionals as they relate to cultural diversity and establishing positive community relationships.

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Criminal Justice PSU (AS)

Degree: Criminal Justice (AS)
Transfer University: Portland State University

TERM 1			
Course #	**Course Title**	**Credits**	**Notes**
WR 121	English Composition	3	
CJ 100	Introduction to Criminal Justice	4	
SOC 204	Introduction to Sociology	3	ANTH101, 221, 230, ECON201, HST101, 201, PSY 100, 201
BI 101	General Biology	4	BI201, CHEM221, F250, G201, GS104, PH201
	Specific Elective	3	CJ180, 201,203, 204, 210, 214, 230, 233, 240, 280, WR227 or any other CJ or EM course
	Total Credits	**17**	

TERM 2			
Course #	**Course Title**	**Credits**	**Notes**
WR 122	English Composition	3	
CJ 101	Introduction to Criminology	4	
SOC 205	Social Institutions and Change	3	ANTH 102, 222, 231, ECON202, PSY202, ED258, HST102, 202
BI 102	General Biology	4	BI202, CHEM222, G202, GS105, PH202
CJ 110	Intro to Policing	4	
	Total Credits	**18**	

TERM 3			
Course #	**Course Title**	**Credits**	**Notes**
WR 123	English Composition	3	WR 227
MTH 105	Math in Society	4	MTH111
SOC 206	Social Problems and Issues	3	ANTH103, 223, 232,PS202, 203, 205,PSY203, HST 103,203,
BI 103	General Biology	4	BI203, CHEM223, G203, GS106
CJ 220	Introduction to Substantive Law	4	
	Total Credits	**18**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Criminal Justice PSU (AS)

TERM 4			
Course #	**Course Title**	**Credits**	**Notes**
PE 185		1	PE 231, HE250
PS 201	American Government: Political Institutions	3	BA101, CJ201, HDFS140, 222, HST104, SOC210, 213, 218, 230
MTH 243	Intro to Probability and Statistics	4	
ENG 104	Introduction to Literature Fiction	3	ART131, 204, ENG201, HUM204, MUS 201, PHL101, SP220
CJ 222	Constitutional Law	4	
	Total Credits	**15**	

TERM 5			
Course #	**Course Title**	**Credits**	**Notes**
CJ 130	Corrections an Introduction	4	
CIS 120	Concepts of Computing	4	
ENG 105	Introduction to Literature Drama	3	ART205, ENG202, HUM205, PHL102, SP220
PE 185		1	PE231, HE 250
	Specific Elective	3	CJ180, 201,203, 204, 210, 214, 230, 233, 240, 280, WR227 or any other CJ or EM course
	Total Credits	**15**	

TERM 6			
Course #	**Course Title**	**Credits**	**Notes**
CJ 247	Ethics in Criminal Justice	3	
ENG 106	Introduction to Literature Poetry	3	ART206, ENG203, HUM206, PHL103
PE 185		1	PE231, HE 250
	Specific Elective	3	CJ180, 201,203, 204, 210, 214, 230, 233, 240, 280, WR227 or any other CJ or EM course
SP 111	Public Speaking	3	SP112, 218, 219
CJ 162	Public Safety First Aid	1	
	Total Credits	**14**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Fire Science (AAS)

Associate of Applied Science Degree (AAS)		
Requirements	**Courses**	**Credits**
Related Instruction Courses must be selected from the approved list of Related Instruction (General Education) courses. All Related Instruction (General Education) courses must be completed with a grade of 'C' or better.		
Writing Three (3) credit hours at a level equivalent to WR115 or higher	WR121 – English Composition (Or any three (3) credit writing course higher than WR121)	3
Communication Three (3) credit hours at a level equivalent to SP100 or higher	SP111 – Fundamentals of Public Speaking	3
Computation Three to four (3-4) credit hours at a level equivalent to MTH60 or higher.	MTH60 – Algebra I (or MTH65 or higher, excluding MTH81 and MTH211)	4
Human Relations Three (3) credit hours or as specified in the AAS degree program.	BA110 – Group Dynamics for Teams	3
Health, Wellness and Fitness PE185 (3 courses) or one (1) three credit course from HE250 or PE231	PE231 – Wellness for Life	3
Digital Literacy Four (4) credit hours CIS120	CIS120 – Concepts of Computing	4
Program Required Courses		
	FS100 – Principles of Emergency Services FS105 – Firefighter Fundamentals I FS180 – Internship: Fire Science (2) FS110 – Firefighter Fundamentals II FS120 – Building Const Related to Fire Svc FS121 – Fire Behavior and Combust FS115 – Firefighter Fundamentals III FS125 – Principles of Fire and Emergency S FS200 – Strategy and Tactics FS205 – Fire Prevention FS231 – Fire Protection Hydraulics and Water FS280 – CWE: Fire Science (2) FS215 – Legal Aspects of Emergency Services FS220 – Fire Protection Systems FS225 – Prin of Fire & Emerg Service Admin	54

	FS232 – Occupational Safety and Health ES EMT151 – EMT Part A EMT152 – EMT Part B	

Electives		
	Any FS, EM, EMT, or CJ course may be taken to fulfill this requirement. (At least eight (8) credits of specific electives must be FS courses) Recommended Specific Electives: FS123 – Structural Firefighter I FS130 – Fire Apparatus Driver/Operator FS210 – Hazardous Materials FS222 – Fire Instructor I	16
Total		90

Prerequisites

CIS90 – Computer Basics (or demonstrate proficiency) (2)
MTH20 – Basic Mathematics (or placement in higher math course) (4)
WR90R – Academic Literacy (or placement in higher writing course) (4)

Program Outcomes

- Demonstrate technical proficiency in fundamental firefighting skills.
- Apply critical-thinking and decision-making skills relevant to fire service scenarios.
- Demonstrate behaviors consistent with professional and employer expectations.

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Fire Science (AAS)

Degree: AAS in Fire Science

Transfer University: N/A

TERM 1			
Course #	**Course Title**	**Credits**	**Notes**
FS100	Principles of Emergency Services	3	
FS105	Firefighter Fundamentals I	2	
FS180	Internship: Fire Science	1	
MTH60	Algebra I	4	MTH 65 Algebra II or higher may be substituted, excluding MTH81 and MTH211.
WR121 or	English Composition	3	May substitute three (3) credits of Writing at a higher level than WR121 to fulfill this requirement.
	Total Credits	**13**	

TERM 2			
Course #	**Course Title**	**Credits**	**Notes**
CIS120	Concepts of Computing	4	
FS110	Firefighter Fundamentals II	2	
FS120	Building Const Related to Fire Svc	3	
FS121	Fire Behavior and Combust	3	
FS180	Internship: Fire Science	1	
SP111	Fundamentals of Public Speaking	3	
	Total Credits	**16**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Fire Science (AAS)

TERM 3			
Course #	**Course Title**	**Credits**	**Notes**
FS115	Firefighter Fundamentals III	2	
FS125	Principles of Fire and Emergency S	4	
PE231	Wellness for Life	3	HE250
BA110	Group Dynamics for Teams	3	
Specific Elective	Any FS, EM, EMT, or CJ course may be taken to fulfill this requirement.	4	Must not already be a required course. At least eight (8) credits of specific electives must be FS courses. Recommended Specific Electives: FS123 – Structural Firefighter I FS130 – Fire Apparatus Driver/Operator FS210 – Hazardous Materials FS222 – Fire Instructor I
	Total Credits	**16**	

TERM 4			
Course #	**Course Title**	**Credits**	**Notes**
FS200	Strategy and Tactics	3	
FS205	Fire Prevention	3	
FS231	Fire Protection Hydraulics and Water	3	
FS280	CWE: Fire Science	1	
Specific Elective	Any FS, EM, EMT, or CJ course may be taken to fulfill this requirement.	4	Must not already be a required course. At least eight (8) credits of specific electives must be FS courses. Recommended Specific Electives: FS123 – Structural Firefighter I FS130 – Fire Apparatus Driver/Operator FS210 – Hazardous Materials FS222 – Fire Instructor I
	Total Credits	**14**	

SOUTHWESTERN OREGON COMMUNITY COLLEGE

Fire Science (AAS)

TERM 5			
Course #	**Course Title**	**Credits**	**Notes**
FS215	Legal Aspects of Emergency Services	3	
FS220	Fire Protection Systems	3	
FS280	CWE: Fire Science	1	
EMT151	Emergency Medical Technician Part A	5	
Specific Elective	Any FS, EM, EMT, or CJ course may be taken to fulfill this requirement.	4	Must not already be a required course. At least eight (8) credits of specific electives must be FS courses. Recommended Specific Electives: FS123 – Structural Firefighter I FS130 – Fire Apparatus Driver/Operator FS210 – Hazardous Materials FS222 – Fire Instructor I
	Total Credits	**16**	

TERM 6			
Course #	**Course Title**	**Credits**	**Notes**
FS225	Prin of Fire & Emerg Service Admin	3	
FS232	Occupational Safety and Health ES	3	
EMT152	Emergency Medical Technician Part B	5	
Specific Elective	Any FS, EM, EMT, or CJ course may be taken to fulfill this requirement.	4	Must not already be a required course. At least eight (8) credits of specific electives must be FS courses. Recommended Specific Electives: FS123 – Structural Firefighter I FS130 – Fire Apparatus Driver/Operator FS210 – Hazardous Materials FS222 – Fire Instructor I
	Total Credits	**15**	