2017

Physics Program Review

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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

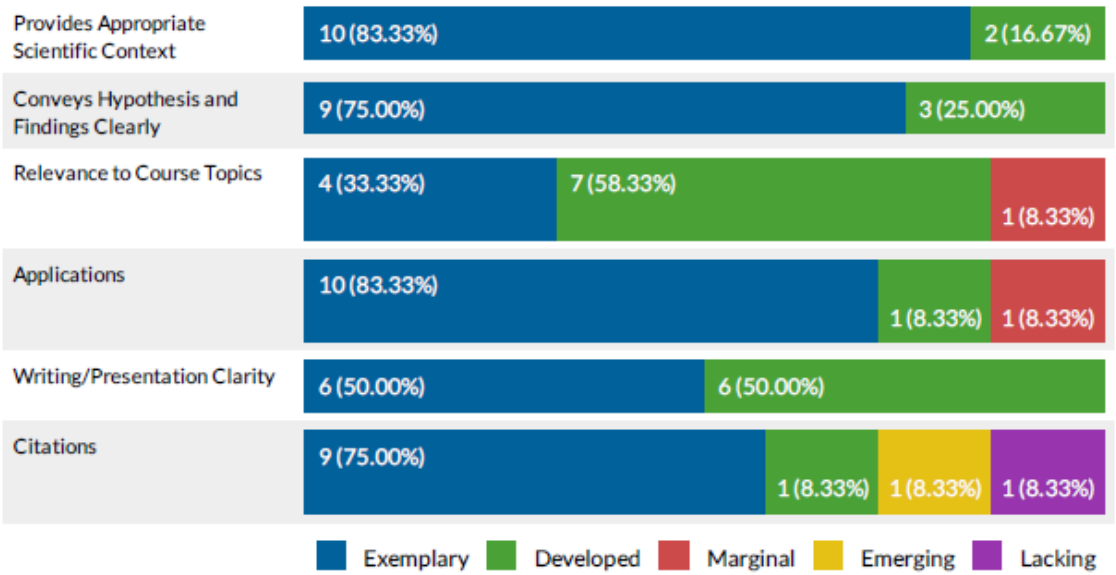
Comments are generally favorable

Assessments

Fall 2016

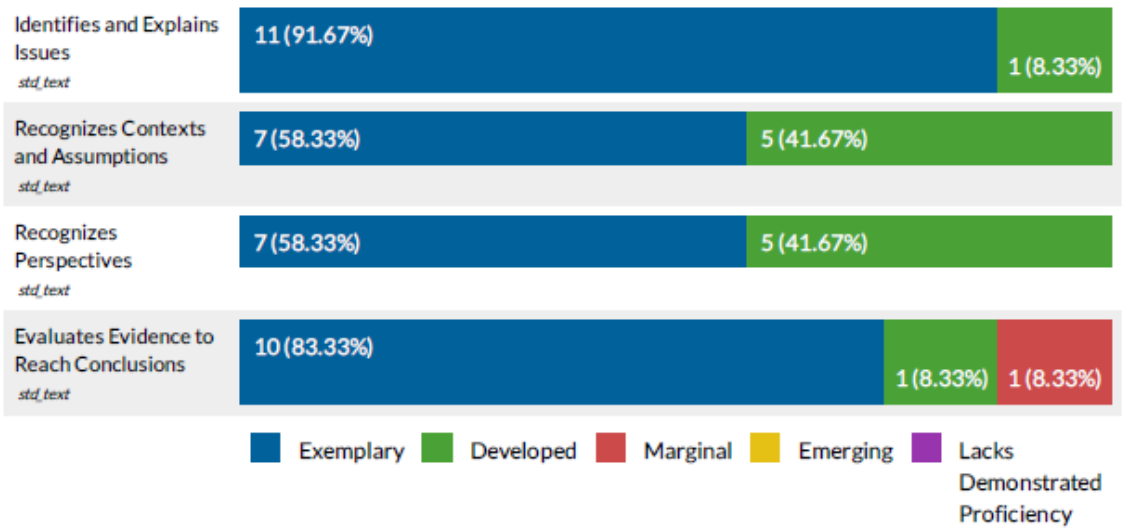
Rubric View: Rubric

	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

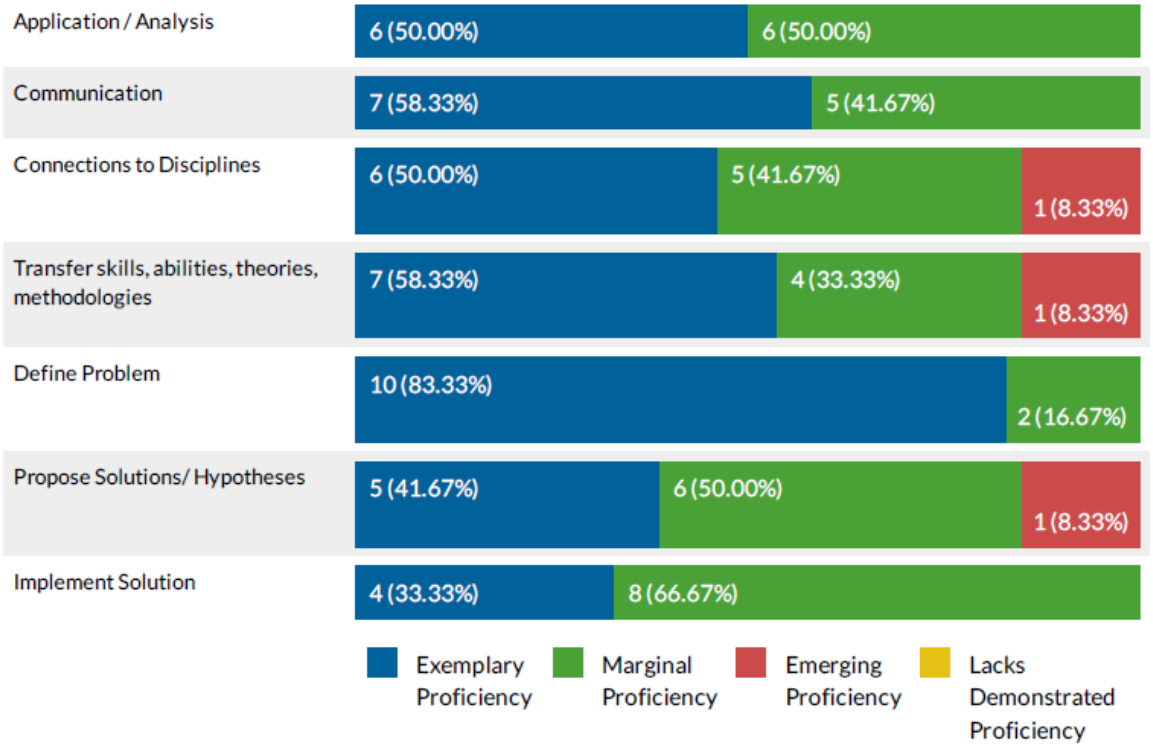
The final piece of the course is to be able to synthesize multiple concepts of the course in one cohesive solution to a complex problem. 3 such problems were given in this term's final and all twelve of the assessed students showed at least developed proficiency in content synthesis.

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.

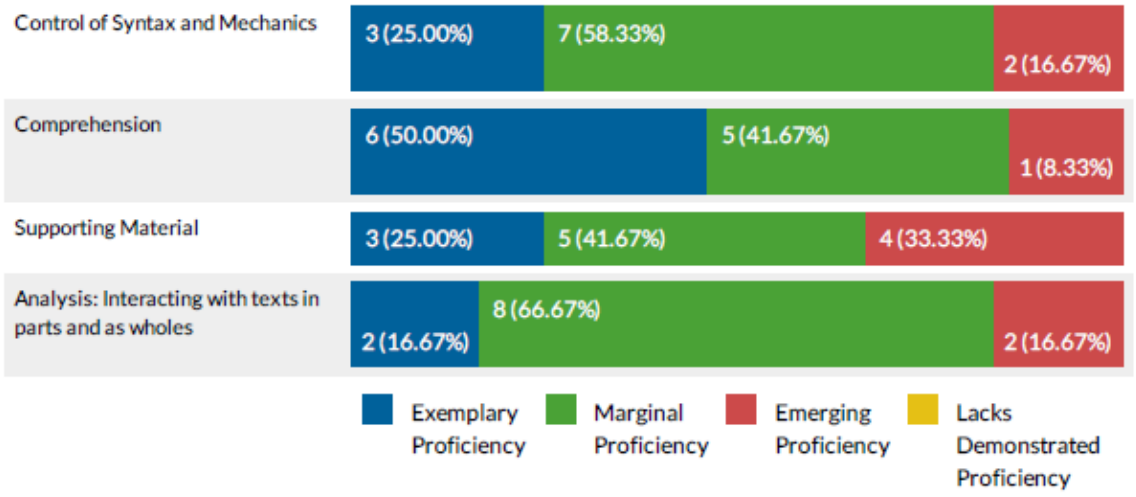
Next year as a progress through the sequence I will continue to reinforce the process as we advance. That along with a new text which presents material in a more logical progression and works with the students to help them learn should greatly benefit the incoming class.

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

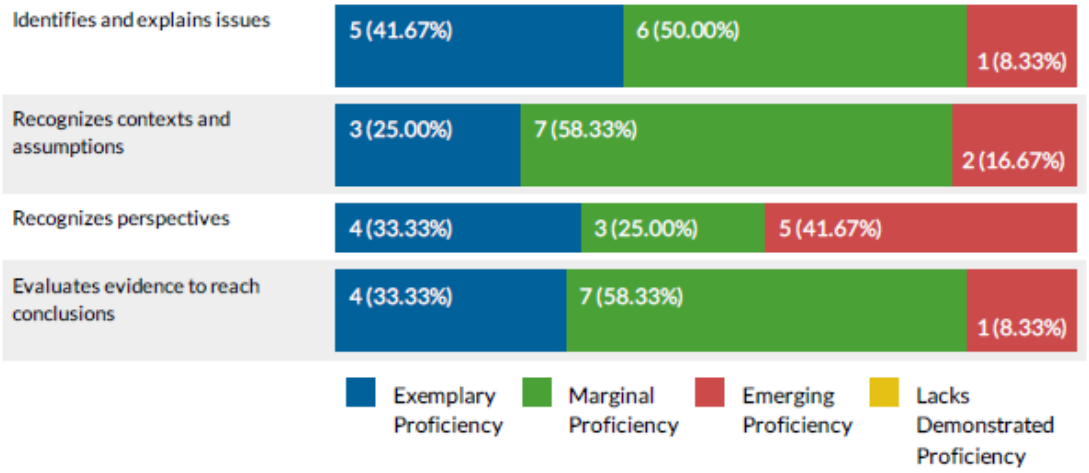
	Exemplary Proficiency (4 pts)	Marginal Proficiency (3 pts)	Emerging Proficiency (2 pts)	Lacks Demonstrated Proficiency (1 pts)	*Mean*	*Mode*	*Stdev*
Control of Syntax and Mechanics	3	7	2	0	3.083	3.000	0.640
Comprehension	6	5	1	0	3.417	4.000	0.640
Supporting Material	3	5	4	0	2.917	3.000	0.759
Analysis: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

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

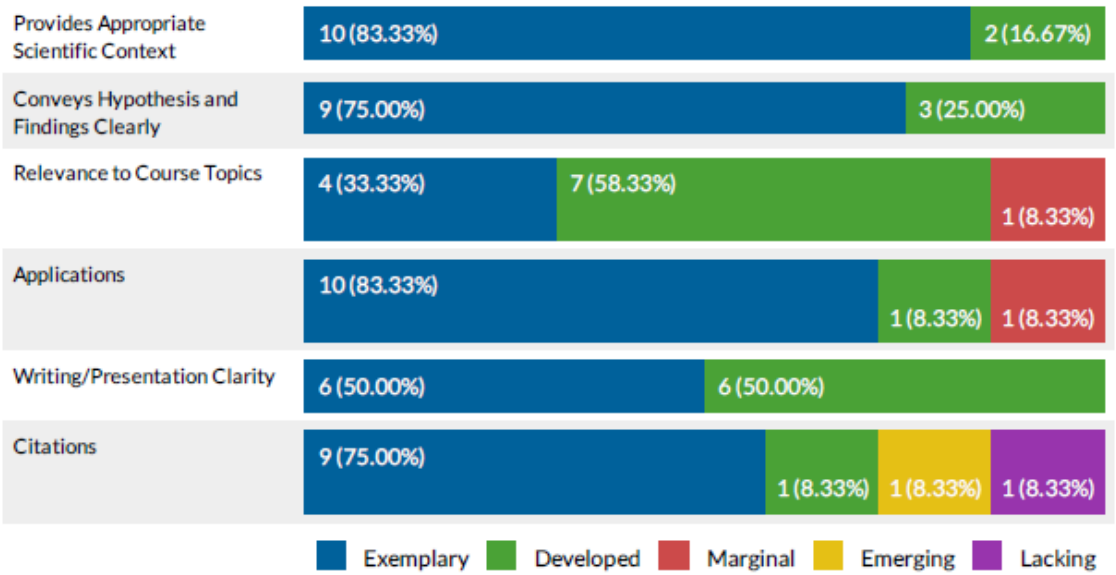
Comments are generally favorable

Assessments

Fall 2016

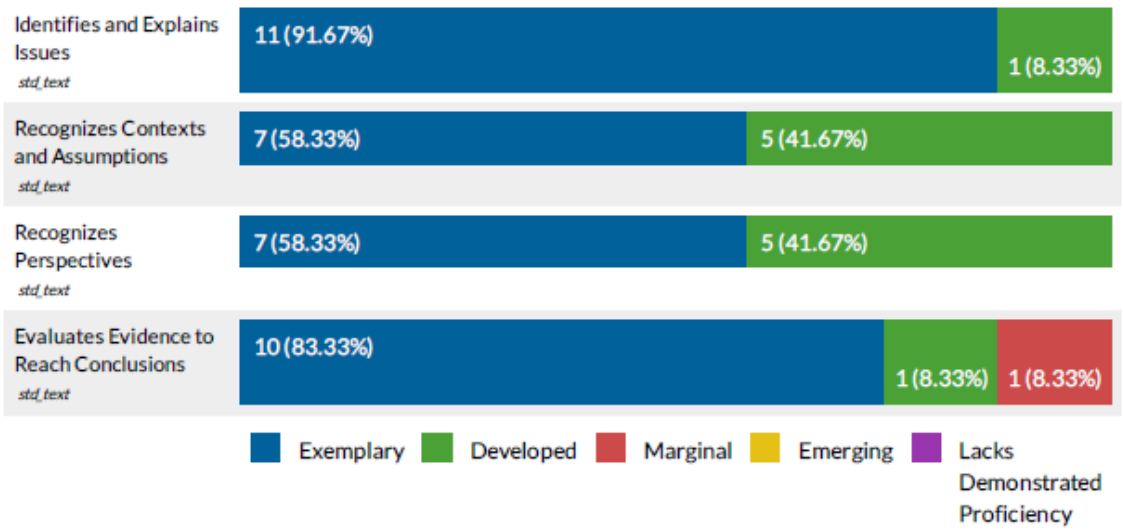
Rubric View: Rubric

	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

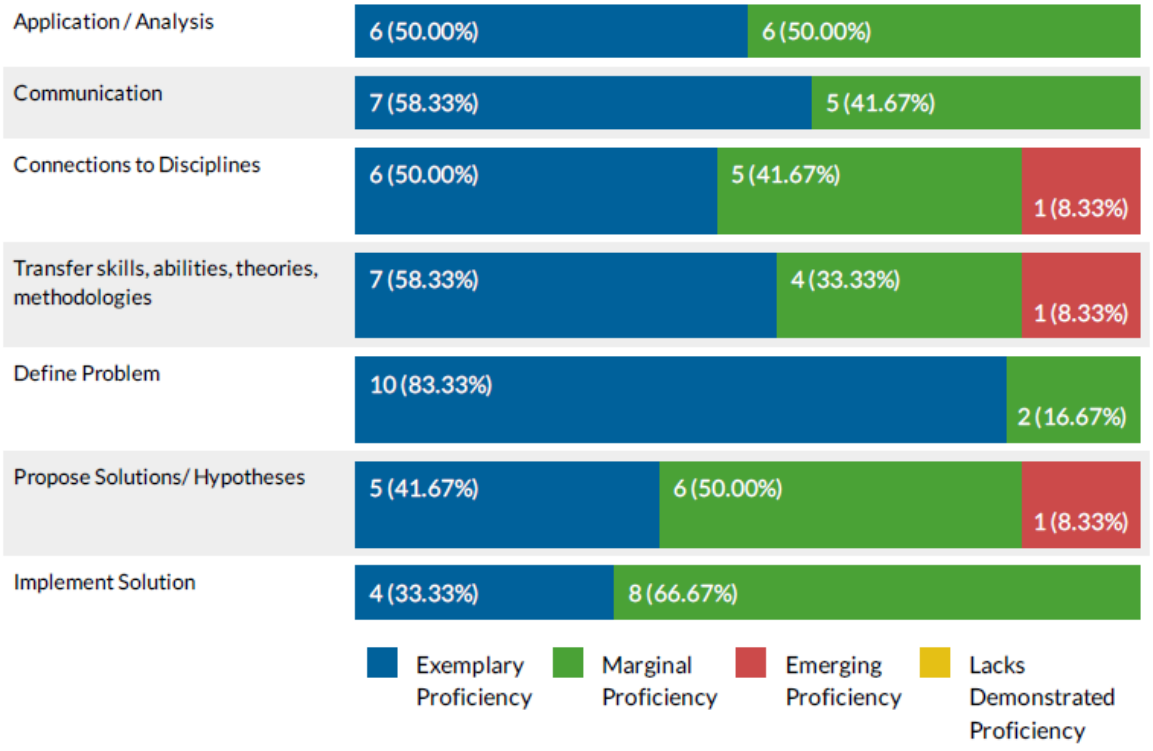
The final piece of the course is to be able to synthesize multiple concepts of the course in one cohesive solution to a complex problem. 3 such problems were given in this term's final and all twelve of the assessed students showed at least developed proficiency in content synthesis.

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.

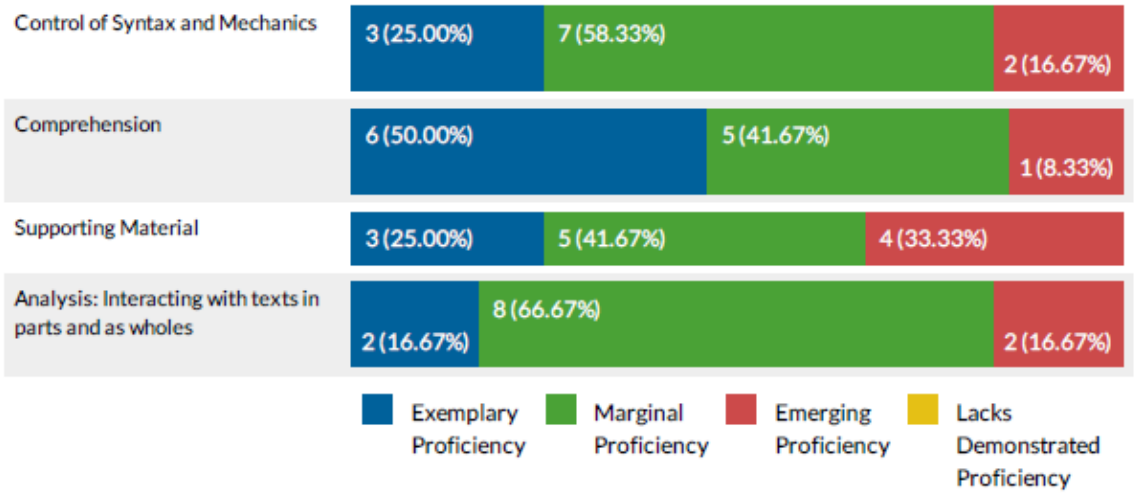
Next year as a progress through the sequence I will continue to reinforce the process as we advance. That along with a new text which presents material in a more logical progression and works with the students to help them learn should greatly benefit the incoming class.

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

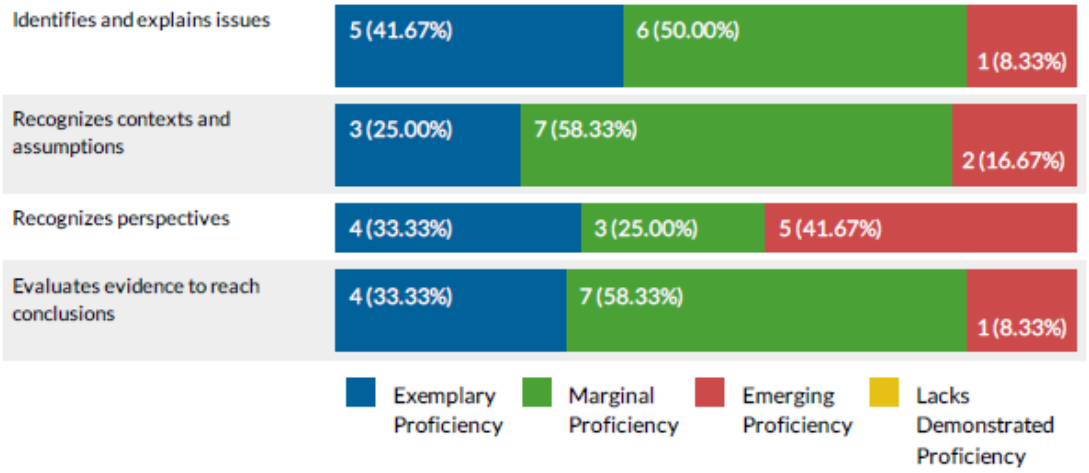
	Exemplary Proficiency (4 pts)	Marginal Proficiency (3 pts)	Emerging Proficiency (2 pts)	Lacks Demonstrated Proficiency (1 pts)	*Mean*	*Mode*	*Stdev*
Control of Syntax and Mechanics	3	7	2	0	3.083	3.000	0.640
Comprehension	6	5	1	0	3.417	4.000	0.640
Supporting Material	3	5	4	0	2.917	3.000	0.759
Analysis: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

SOUTHWESTERN
AN OREGON COMMUNITY COLLEGE

Academic Program/Discipline Review 2017-2018
Chemistry Program

Process

Program/Discipline Review is a continuous process of collecting, evaluating, and using information to determine if and how well performance matches learning or service outcomes. We gather evidence of student learning; discover the degree to which courses, programs, and administrative and educational support services accomplish intended outcomes; and probe the achievement of institutional projects, core themes, and mission. Southwestern conducts program reviews of all programs, disciplines and services on a quadrennial basis (every 4 years) and uses the results of the assessments to enhance and improve current programs and services.

Programs and disciplines will also review data and progress on an annual basis, using Part E only.

Resources

Available from IR – sent out via email or via the online reporting tool (coming soon).

TABLE OF CONTENTS

Program review consists of the following elements

All reports are available within myLakerLink and are located on the Resource Center tab. Links to all reports are located within each section title of this document. Program Review requirements for certain sections include multiple reports with additional links to the reports located within the specific section of the report.

PART A: Program Review Narratives

Program Description and Goals / Philosophy

- **Philosophy of the Program:**

The philosophy of the Chemistry Program at Southwestern Oregon Community College is to provide all students with a strong foundation in both the theory of the chemical sciences, as well as their practice in a modern chemistry laboratory. Collection of scientific data using modern instrumentation and subsequent analysis and communication of results are essential components of the chemistry program, as well as understanding the social and global context and implications of the practice of science. The chemistry program at SWOCC is intended to prepare transfer students for baccalaureate programs through completion of both the AA/OT and the soon-to-be-completed AS in chemistry. To maintain a high standard of excellence, the chemistry program strives to adhere to the 2015 *American Chemical Society Guidelines for Chemistry in Two-Year College Programs*.

- **Describe the Current State of the Program:**

The Chemistry Program at SWOCC seeks to fulfill the following requirements:

1) to maintain a coherent and broad chemistry-based curriculum that develops content knowledge and broader skills through the use of effective pedagogical approaches;

2) to provide a modern and well-maintained laboratory and infrastructure;

3) to provide professional development opportunities for faculty and staff to maintain the aforementioned standards of excellence in both the classroom and the laboratory.

The chemistry program at SWOCC consists of 1 full-time instructor and 1 part-time instructor that teaches 1 online course. Following the retirement of the previous full-time chemistry instructor in 2015, there was a loss of continuity in the chemistry program because there was no communication between the new instructor and the previous instructor and there were no documents pertaining to the lecture or laboratory curriculum. As such, the program has been completely updated and revised since 2015 by the new chemistry instructor. As of fall of 2017, all of the course outlines, course learning outcomes, and program learning outcomes have been revised. In the fall of 2016, an organic chemistry sequence was created and piloted for the first time, CHEM 245/246/247, with a total of 6 students. Also in the fall of 2016, an honors option was added to CHEM 110 and several students have already earned honors credit upon completion of their honor's projects. In the fall of 2017, an Associate of Science in Chemistry was proposed, with articulation to Oregon State University, and the degree is currently being discussed in the Instructional Council of SWOCC. Also in the fall of 2017, a proposal was brought forward to change the course heading of GS 105 (physical science II) to CHEM 105 (introduction to chemistry) and to include the course in the chemistry section of the course catalog. Looking forward, there is a plan to include honors options for all chemistry courses, as well as to create a 100-level, non-majors chemistry sequence. *We need to expand our chemistry course offerings and hire additional part-time and full-time chemistry instructors.*

Although all of the courses in the chemistry program are typically full or waitlisted (with the exception of the new organic chemistry sequence), the chemistry program cannot accommodate any further growth due to a lack of chemistry instructors, both part-time and full-time. Since 2015, there has

been a large waitlist (more than 10 students) for both sections of CHEM 221 in the fall term; if there was a part-time instructor on campus, or the administrative will to allow more "overload", an additional section of CHEM 221 could be opened in the fall. Further, upon completion of the AS in chemistry and the new Health and Science Building, it is likely that there will be an influx of science majors, but for now, there is nowhere for them to go. Brining more students into the general chemistry sequence by adding an additional section of CHEM 221 would also likely add students to the subsequent courses, CHEM 222 and CHEM 223, and even potentially the organic chemistry sequence, CHEM 245/246/247. This "trickle down" effect (or "trickle up", I suppose is more accurate) relies on the fact that access to all of the subsequent chemistry courses at SWOCC requires completion of CHEM 221. The other courses in the chemistry department, CHEM 110 and GS 105, are also full and could accommodate more sections. There are reliably 40-50 students in each of the 2 sections of CHEM 110 offered every term. The only options that students currently have for CHEM 110 are to take the course con-campus MTWF 12-1pm, or to take the online option. If an additional time was available to on-campus students, then it is possible that more students would take the course. Further, with the new Health and Science Building, and because CHEM 110 is a prerequisite for the nursing program, it is likely that a waitlist will begin to develop for CHEM 110 every term, similar to what is currently happening to CHEM 221. GS 105 is only offered in the winter, though in the winter of 2016, it was completely full with 2 students on the wait list. A related but separate issue is that of scheduling: when only 1 time-slot is available for each course, students often have to choose which of the required courses they will take (calculus or chemistry?), since scheduling conflicts often prevent them from taking all of the necessary courses each term… this means that we can't ensure that students will complete the program within two years. *We need more sections of chemistry courses, different time-slot options, and more coordinated scheduling of course offerings.*

Due to a long period of neglect that likely occurred over the course of many years, there was a large collection of chemical waste and expired hazardous chemical reagents that required immediate attention upon arrival of the new instructor in 2015. All of the most immediate hazards were removed from SWOCC, although there is still maintenance of the chemical storage required. Although the clean-up is not completely finished, the chemistry laboratory in the Coaledo building in the fall of 2017 is looking much better than in the fall of 2015. A laboratory curriculum is being developed by the new instructor to reduce the volume of hazardous chemical waste generated, as well as to include disposal of chemical waste as a topic for study and discussion in chemistry courses. The laboratory curricula for both the CHEM 221/222/223 and 245/246/247 sequences will be printed into laboratory manuals that will be available to students in the SWOCC bookstore and can be purchased for the price of printing; this will reduce the financial burden to students who wish to take chemistry courses and will create continuity in the chemistry department, independent of instructor. In addition to maintaining the chemical stockroom and updating the chemical waste procedures, it was necessary to update much of the instrumentation in the chemistry lab. Many new instruments have been procured with the use of the annual chemistry supply budget, though many necessary instruments are too expensive to be purchased with these funds. With the completion of the new Health and Science Building, SWOCC will have a unique opportunity to outfit a chemistry lab with state-of-the-art equipment that will still be relevant for subsequent generations and potentially attract many aspiring scientists and health professionals to our campus and our community. To that end, it is important that SWOCC dedicates enough funding to provide both necessary safety features required to practice modern chemical synthesis, like fume hoods and vacuum lines, as well as to equip the analytical instrumentation room with equipment like an FT-IR spectrometer, FT-NMR spectrometer, and a mass spectrometer. These instruments are considered by the American Chemical Society (ACS) to be standard chemistry instrumentation and use by students is required in all ACS-approved programs. *We need to update and maintain the instrumentation of the chemistry laboratory, create lab manuals for chemistry sequences, and maintain the chemical supply according to OSHA guidelines.*

In addition to more full-time faculty, the chemistry program also requires more support from full-time staff, like a dedicated full-time laboratory assistant. A sustainable and robust chemistry program requires adequate support from technical staff to maintain chemical facilities, instruments, and stockrooms. The number of support staff should be adequate to allow faculty to devote their time and effort to academic responsibilities and scholarly activities. The ACS recommends at least one full-time laboratory assistant to serve every four full-time faculty members; we currently have one part-time laboratory assistant to serve five full-time faculty members. This is not adequate; a substantial amount of faculty time is still required to maintain the laboratory, even with one part-time laboratory assistant, which significantly interferes with providing an excellent laboratory experience for students. Further, the ACS recommends, *and Federal Law mandates*, that the college has a "chemical hygiene officer" with appropriate training and experience to develop, manage, and implement the chemical hygiene plan for the campus: "In order to ensure consistent implementation of safety policies, it is recommended that the duties of a chemical hygiene officer be assigned to a dedicated, full-time position, *rather than added to the teaching duties of the faculty*." *We need at least one dedicated, full-time laboratory assistant to assure OSHA compliance of our chemical stockroom and to maintain our instrument facilities.*

Administration

- **Faculty / Staffing:** The chemistry faculty consists of 1 full-time faculty and, since at least 2012, 1 part-time pharmacy technician faculty member who teaches one online course. The program is also supported by a 19-hour/week laboratory assistant.

- **Professional Development**: The full-time faculty member has attended several conferences, most regarding assessment of student learning, since becoming a faculty member in 2015.

- **Support Services used (or identified need):** The Laker Learning Commons (the tutoring center) and the Library

- **Advisory Committee (activities and membership):** N/A

- **Community Relationships / Partnerships:** The chemistry faculty member has developed informal connections with the owners of 7 Devils Brewing, Stillwagon Distillery, the Coos Bay Municipal Wastewater Plant (CH2M Hill), DB Western, the South Slough Nature Reserve, the Oregon Coast STEM Hub, and the Charleston Marine Life Center. A network of possible internship opportunities, as well as the development of an Associate of Science in Food/Fermentation Science has begun as a direct result of these relationships.

- **Program Accreditation (if applicable):** N/A

Curriculum

- **Degrees/Certificates offered and changes since last review**: An AS in chemistry has been developed and submitted to the administration of SWOCC for approval in fall 2017.

- **Course list and changes since last review, including new and revised courses:** All chemistry course outlines, course learning outcomes, and program learning outcomes have been updated. An organic chemistry sequence was developed: CHEM 245/246/247.

- **Career Pathway/Program of Study Efforts:** N/A

- **Delivery Methods/Instructional Methodology:** Traditional, face-to-face instruction is the dominant delivery method in the chemistry department, with most courses being offered only as a face-to-face course, and others, like CHEM 110 and GS 105, offered as online courses. During the summer of 2017, CHEM 221 was piloted as an online course, with online lab experiments.

- **Articulation/Transferability:** During the development of the AS in chemistry in 2017, the articulation of all SWOCC chemistry courses to OSU was confirmed. Once the AS in chemistry is approved, the full-time chemistry faculty member intends to reach out to SOU, EOU, WOU, OHSU, etc. to confirm articulation/transferability.

- **Dual Credit offerings:** The chemistry department does not currently have any dual credit agreements.

- **Course scheduling issues:** Because there is only one section of each course, students often can't take all of the courses required by their program in the same term; PHYS 211 vs CHEM 245 is one issue (both second year courses); CHEM 221 vs MTH 251 is another. Students are required to take both CHEM 221 and MTH 251 in the same term, if they are to stay on track; our current schedule does not allow this. Surely, there are other examples.

- **Instructional Materials (textbook, software issues):** The chemistry faculty choose the textbooks that they will use in their courses. The textbooks are available at the college bookstore or from online sources. Students are also required to purchase an access code for an online homework system called Sapling Learning.

- **Current or planned use of Open Education Resources:** In 2016, the full-time chemistry instructor was awarded a grant from Open Oregon to develop and utilize Open Educational Resources in two chemistry courses: CHEM 110 and GS 105. The instructor modified two OER textbooks that were available on the OpenStax platform. The textbooks were customized to fit the content and the schedule of the specific course. Both of these OER resources are available for free as PDF files, or as a printed copy for the cost of the paper and ink from the SWOCC bookstore. The chemistry instructor has plans to develop OER textbooks for both CHEM 221/222/223 sequence, as well as the CHEM 245/246/247 sequence. Further, the chemistry instructor is creating lab manuals for both general and organic chemistry sequences that will be available for free as a PDF file, or for a nominal cost from the SWOCC bookstore. A supply of lab coats and goggles is being collected by donation to serve students that can't afford to purchase these required materials. It is the desire of the chemistry faculty that all of the required chemistry materials will be available for free or with a small fee to cover the costs of production.

Students

- **Special Populations:** The Chemistry program special populations include EMT-Paramedic, Forestry, Marine Biology, Natural Resources, and Nursing which all recommend or require chemistry courses.

- **Recruitment:** Although the chemistry program does not actively recruit, there have been discussions with other STEM faculty about creating a science presentation for local high schools to showcase the STEM programs at SWOCC.

- **Advising:** The full-time chemistry faculty member has been reaching out to several chemistry departments around the state to ensure that our courses will transfer to their institutions. Advising sheets are being developed from these conversations. Further, if the AS in Chemistry is approved and is articulated to OSU, this will likely provide some legitimacy to our department, facilitating the transfer of our courses to other universities.

- **Student Satisfaction:** Evaluations of the full-time chemistry instructor who teaches face-to-face classes in the chemistry program have been strong, with an average score of 4.6 out or 5.0 for face-to-face courses. Further, the full-time instructor was voted, by students, as the "Staff Member of the Year" for the 2016-2017 academic year, a measure that indicates that students are highly satisfied with the full-time chemistry instructor.

- **Student Assessment Methods:** Chemistry program learning outcomes that are related to the discipline-specific content of chemistry are assessed using the American Chemical Society standardized exams. Program learning outcomes that are related to the collecting, analysis, and communication of scientific data and information are assessed by scoring student laboratory reports with three VALUE rubrics: critical thinking, information literacy, and global learning. Both assessments are completed by examining summative assignments, those that require the culmination of skills collected throughout the term, like Final Exams and Final Capstone Laboratory Reports.

- **Pre-enrollment Requirements (Nursing, EMT, ECE, other):** N/A

Facilities/Budget

- **Budget Changes over past 4 years:** The only full-time faculty member started in 2015 and since then, there have been no changes to the budget. In Fall of 2016, a request was made to increase the budget of the chemistry program to accommodate three new laboratory courses that were developed (CHEM 245, CHEM 246, and CHEM 247) and approved. The budget request was denied. *So although the total amount of money allocated to the chemistry program has not changed, the amount of money that can be spent on each course has significantly decreased from 25% (4 total lab courses) of the total budget per lab course to less than 14% (7 total lab courses).*

- **Instructional Materials (software, supplies, etc.):** The new Health and Science Building will require a significant investment in new instructional materials. A dedicated computer lab for science students is needed for the future, especially with the possible creation of an Engineering program at SWOCC; there are many science-specific software programs that students should have experience with before transferring to a 4-year school. There is currently not a "software budget" for the chemistry department, or even a computer lab for students, so developing this facility in the new Health and Science Building should be a priority.

- **Equipment lists and needs:** The new Health and Science Building will require a significant investment in new equipment. As mentioned earlier, the ACS recommends that excellent chemistry programs have the following instruments that we do not: FT-IR spectrometer, FT-NMR spectrometer, and a mass spectrometer. To develop an active student research program, the chemistry department should also consider procuring more specialized equipment, like a polarizing light microscope with a hot-stage and a camera. Further, there has been discussion about the development of a fermentation science program at SWOCC, which might include aspects of wastewater treatment and analysis of distilled spirits. A Total Organic Carbon (TOC) Analyzer, made by General Electric, will help the chemistry department at SWOCC better serve our community by extending the analytical capabilities of the local municipalities.

- **Facilities lists and needs:** Although there has been a lot of focus on the material needs of the new Health and Science building, it is very important to not overshadow the necessity of support staff. It is essential to have *at least one full-time laboratory assistant* in the new building. It would also be worthwhile to explore dedicated science advisors and administrative support for extracurricular science activities, like internships and grant writing.

- **Student fees:** N/A

PART B: Annual Institutional Assessment Rubric

This rubric is completed by all departments and programs of campus *each year* that provides a "list" of items that are important to review including ***mandatory reporting requirements*** (accreditation, IPEDS, HEOA if applicable), policies and procedures in place and followed, etc.). Click on the blank rubric link below to access the document. If this is the first year that the assessment is being completed or you need help, please meet with support staff to complete the rubric.

myLakerLink Blank Rubric

- Review the rubric and self-assess the threshold level for each section
- Reflect on what has been accomplished, what needs to be enhanced, and what needs to be developed
- List the overall achievement by each level
    - **0 were at a green level**
        - ### within the Mandatory Reporting and Compliance **(N/A for Chemistry program)**
        - ### within the Policies, Procedures, Process **(N/A for Chemistry program)**
        - **0 within the Qualitative**
        - **0 within the Resource and Staffing Review**
    - **11 were at a yellow level**
        - ### within the Mandatory Reporting and Compliance **(N/A for Chemistry program)**
        - ### within the Policies, Procedures, Process **(N/A for Chemistry program)**
        - **4 within the Qualitative**
        - **7 within the Resource and Staffing Review**
    - **3 were at a red level**
        - ### within the Mandatory Reporting and Compliance **(N/A for Chemistry program)**
        - ### within the Policies, Procedures, Process **(N/A for Chemistry program)**
        - **0 within the Qualitative**
        - **3 within the Resource and Staffing Review**

- List plans to enhance and develop items/projects identified from the rubric assessment – add to planned projects

To enhance the **Quality** of the services provided by the Chemistry Department, the STEM faculty should:

1. Identify a list of potential scholarships, internships, research opportunities, and grant opportunities for interested STEM students;
2. Schedule a meeting/event with all STEM faculty to help interested students apply for aforementioned opportunities;
3. Ensure that the all STEM courses at SWOCC articulate and transfer to Oregon Universities.

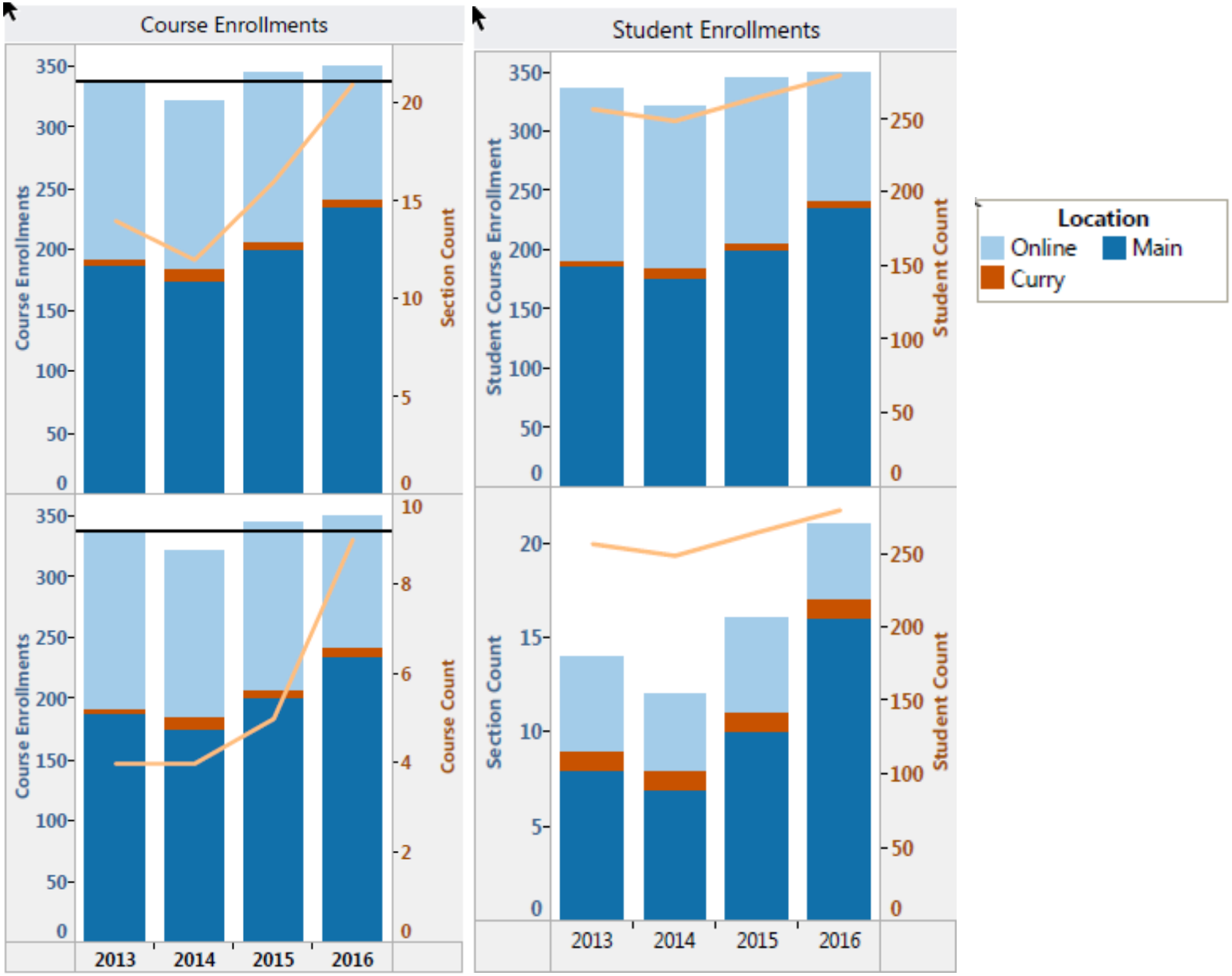
To enhance the **Resource and Staffing** services provided by or to the Chemistry department, the institution should:

1. Convert the laboratory assistant position to a full time position;
2. Develop Standard Operating Procedures for the laboratory assistant position;
3. Send the laboratory assistant to participate in training events for OSHA and other compliance.

PART C: Program Operational Data Review

I Enrollments

Exhibit I.A: Total Enrollments – Program (course view document)



- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps* (Examples: Essentially steady until 2011 and 2012. A dip in enrollment occurred. There were questions asked concerning students being appropriately advised. Prerequisites issues will impact enrollment for 2014-2015.)

  The data suggest that course and student enrollments have been on the rise since 2014. A dip in enrollment occurred between 2013 – 2014, but this was before the current instructor's arrival, so a cause cannot be speculated. *Overall, the trends in enrollment are encouraging and indicate a healthy and growing chemistry program.*

  Enrollments at the Curry campus appear to remain steady between 2013 and 2016, but *enrollments on the Coos campus are increasing significantly*. Student count by section indicates about 127 students in 2014 and more than 173 in 2016 on the Coos campus, an increase of 36% in two years!

  Although enrollment in online courses appears to have been constant between 2013 – 2015, it appears that there is a decrease in enrollment in online courses starting in 2016. The only online course offered by the chemistry department during these times was CHEM 110, so any drop in online enrollment means a drop in online CHEM 110 enrollment. Some research suggests that this drop may have been caused by an increase in the enrollment of on campus CHEM 110. During fall 2014 – 2015, an on-campus CHEM 110 was not offered, so the online option was typically full; it is not known if this was the case in previous academic years. An on-campus CHEM 110 in now offered every term, which started in the fall of 2015-2016. This is one possible explanation of the drop in online enrollment that started in 2016. Moving forward, online sections of GS 105 and CHEM 221 were offered during the summer of 2016-2017, which could help to increase online enrollment.

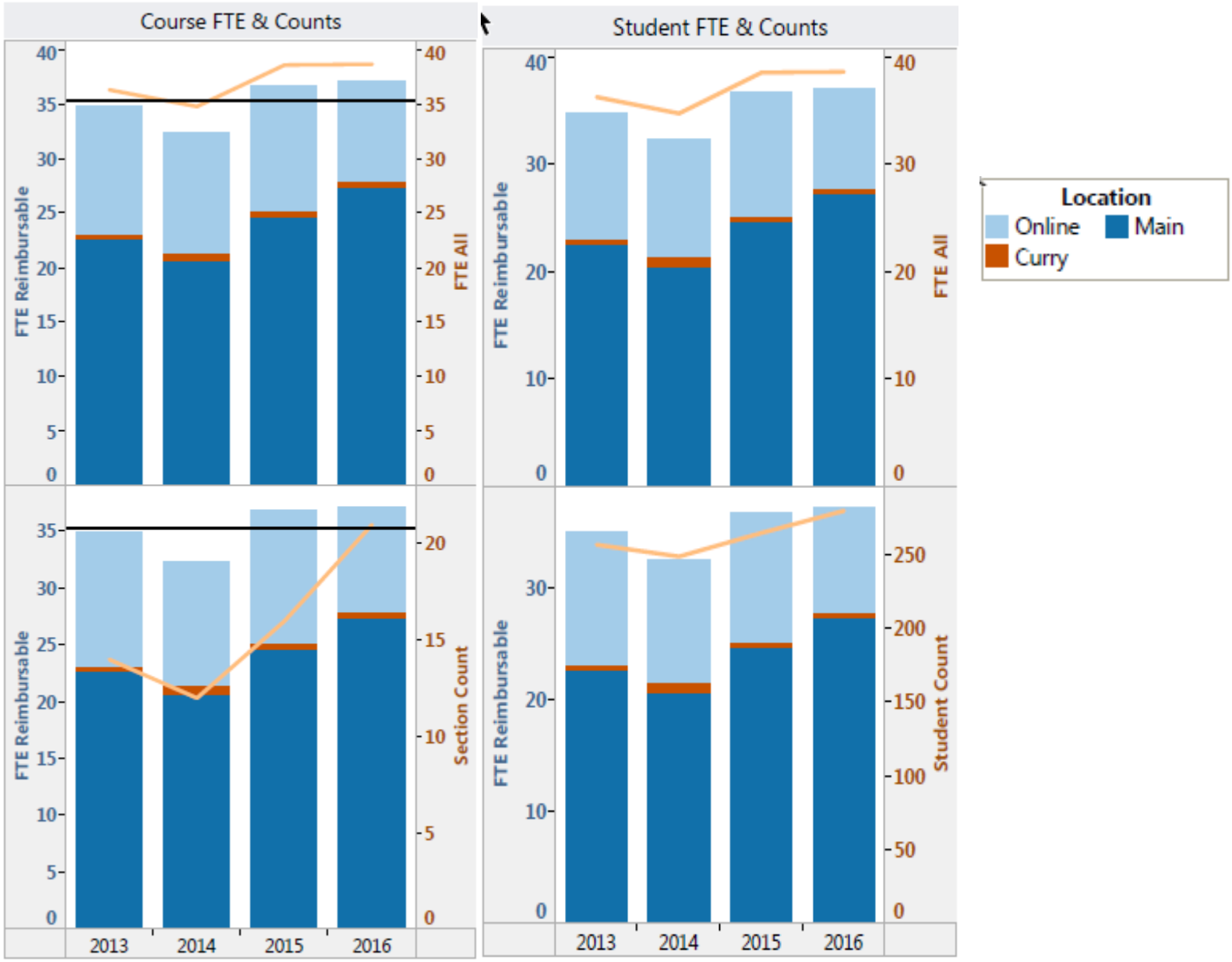
- **Plan**: To continue to increase enrollment in chemistry courses:
  - *Increase enrollment in on-campus courses* by offering more sections of waitlisted courses, better coordinating the schedules of STEM courses, and creating an AS degree in chemistry.
  - *Increase enrollment in online courses* by offering more sections of online chemistry courses, including lab courses.

  - **Indicator** (Enrollment, measured by the 5-year average compared to current enrollment)

    - **Threshold:** Green: Enrollments Increase Yellow: Enrollments Stagnate Red: Enrollments Decline

II. Financial Viability

Exhibit II.A: Student FTE (course view document)



- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps* (Example: FTE and billing responds directly to enrollment in reading classes. The data collected during the 2011-2012 academic year, in particular the FTE's and Calculated Cost per Student's FTE, is the result of a reduction in spending more than a reduction in student enrollment. As of 2013, class sizes were monitored closely and sections were adjusted as needed.)

  The data suggest that FTE generated in the chemistry department has been on the rise since 2014. A dip in enrollment occurred between 2013 – 2014, but this was before the current instructor's arrival, so a cause cannot be speculated. The total FTE generated by the chemistry department increased from 37.5 in 2013 to 39.6 in 2016, a 5.6% increase. *Overall, the trends in FTE are encouraging and indicate a healthy and growing chemistry program.*

  FTE at the Curry campus appear to remain steady between 2013 and 2016, but *FTE at the Coos campus is increasing significantly*. 21.8 FTE was generated in 2014 and 28.4 FTE was generated in 2016 on the Coos campus, an increase of 30% in two years!

  Although FTE in online courses appears to have been constant between 2013 – 2015, it appears that there is a decrease FTE in online courses starting in 2016. The only online course offered by the chemistry department during these times was CHEM 110, so any drop in online FTE means a drop in online CHEM 110 enrollment. Some research suggests that this drop may have been caused by an increase in the enrollment of on-campus CHEM 110. During fall 2014 – 2015, an on-campus CHEM 110 was not offered, so the online option was typically full; it is not known if this was the case in previous academic years. An on-campus CHEM 110 in now offered every term, which started in the fall of 2015-2016. This is one possible explanation of the drop in online FTE that started in 2016. Moving forward, online sections of GS 105 and CHEM 221 were offered during the summer of 2016-2017, which could help to increase online enrollment and FTE.

- **Plan**: To continue to increase FTE generated by the chemistry department:
  - *Increase FTE in on-campus courses* by offering more sections of waitlisted courses, better coordinating the schedules of STEM courses, and creating an AS degree in chemistry.
  - *Increase FTE in online courses* by offering more sections of online chemistry courses, including lab courses.

  - **Indicator** (FTE, measured by the 5-year average compared to current FTE)

    - **Threshold:** Green: FTE Increases Yellow: FTE Stagnates Red: FTE Declines

III. Efficiency of Delivery

Exhibit III.A: Average Class Enrollments (course view)

Course	Status	Enrollment Count 2013	2014	2015	2016
CHEM 110	Passing	127.0	119.0	147.0	165.0
	NonPassing	111.0	96.0	76.0	64.0
	Audit				2.0
	Total	**238.0**	**215.0**	**223.0**	**231.0**
CHEM 110H	Passing				1.0
	Total				**1.0**
CHEM 180	Passing			1.0	1.0
	Total			**1.0**	**1.0**
CHEM 221	Passing	39.0	33.0	46.0	38.0
	NonPassing	8.0	13.0	9.0	13.0
	Total	**47.0**	**46.0**	**55.0**	**51.0**
CHEM 222	Passing	19.0	23.0	30.0	22.0
	NonPassing	12.0	4.0	5.0	4.0
	Total	**31.0**	**27.0**	**35.0**	**26.0**
CHEM 223	Passing	14.0	17.0	24.0	19.0
	NonPassing	5.0	3.0	4.0	
	Total	**19.0**	**20.0**	**28.0**	**19.0**
CHEM 245	Passing				6.0
	Total				**6.0**
CHEM 246	Passing				6.0
	Total				**6.0**
CHEM 247	Passing				4.0
	NonPassing				1.0
	Total				**5.0**
GS 105	Passing	17.0	16.0	14.0	22.0
	NonPassing	5.0	1.0	3.0	1.0
	Total	**22.0**	**17.0**	**17.0**	**23.0**

Exhibit III.B: Typical Course Capacity Percentages since 2015

	Course Enrollment	Course Capacity	Course Capacity Percentage
GS 105	18-24	24	**75–100%**
CHEM 110	40-50	50	**80–100%**
CHEM 110 (online)	30-35	50	**60–70%**
CHEM 221	46-54	48	**96–112.5%**
CHEM 222	26-35	48	**56–73%**
CHEM 223	19-28	48	**40–58%**
CHEM 245	6	24	**25%**
CHEM 246	6	24	**25%**
CHEM 247	6	24	**25%**

- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps*

Example: Reading class sections are being closely monitored, resulting in improved fill rates.

The data suggest that the chemistry program is growing, but can't accommodate further growth without intervention. Course enrollments and FTE have been steadily increasing since 2013, but there is only one full-time instructor and one part-time instructor, so it is difficult to add more sections or more courses.

There is a bottle-neck that is limiting enrollment in higher-level chemistry courses: CHEM 221. This course has been full or near capacity since at least 2013. Most recently in fall 2017-2018, both sections of CHEM 221 were full with more than 12 students on the waitlist before the fall term. This resulted in a course enrollment of 54 students (112.5% capacity) because the instructor was actively trying to accommodate every student on the waitlist. This is not sustainable: students can't complete their programs within two years because of the limited capacity of CHEM 221 and having more than 24 students in the laboratory at one time is a safety issue. Adding another section of CHEM 221 would likely increase the enrollment in all subsequent chemistry courses, for which CHEM 221 is a prerequisite. However, because scheduling of STEM courses is typically accomplished by copying what was done in previous years, adding a new section of CHEM 221 could result in scheduling conflicts. STEM faculty will need to work together to ensure that courses don't overlap.

Not only is CHEM 221 full, but so too are CHEM 110 and GS 105. Although adding another section of any of these courses would potentially decrease the enrollment in each specific section, it is likely that the total enrollment across all sections would increase.

- **Plan**: To continue to increase FTE and enrollment generated by the chemistry department:
  - *Increase FTE in on-campus courses* by offering more sections of waitlisted courses, better coordinating the schedules of STEM courses, and creating an AS degree in chemistry.
  - *Increase FTE in online courses* by offering more sections of online chemistry courses, including lab courses.

  - **Indicator** (FTE, measured by the 5-year average compared to current FTE)

    - **Threshold:** Green: FTE Increases Yellow: FTE Stagnates Red: FTE Declines

IV. Instructional Effectiveness

Exhibit IV.A: Course Retention – completion rate and pass rate

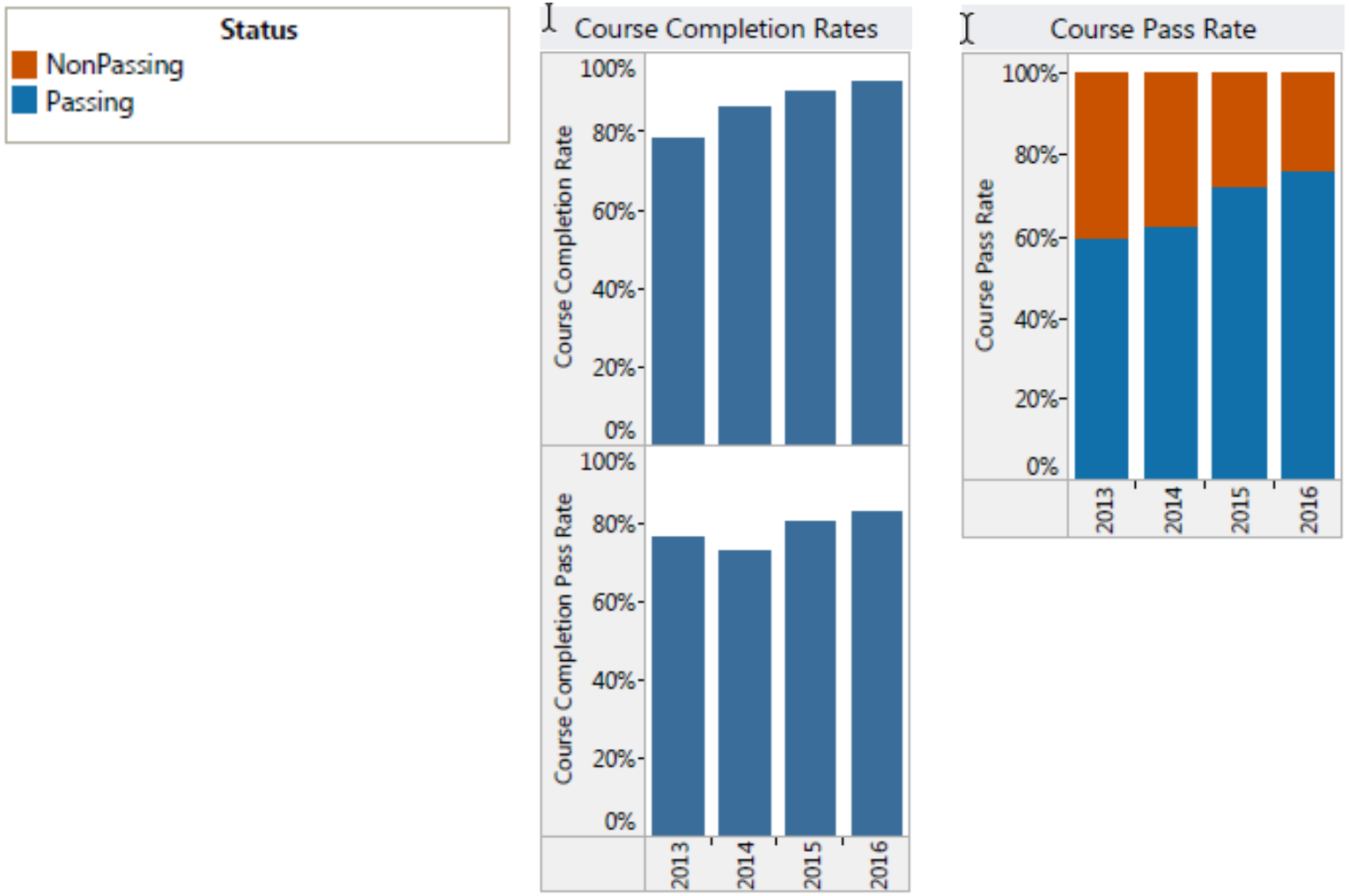
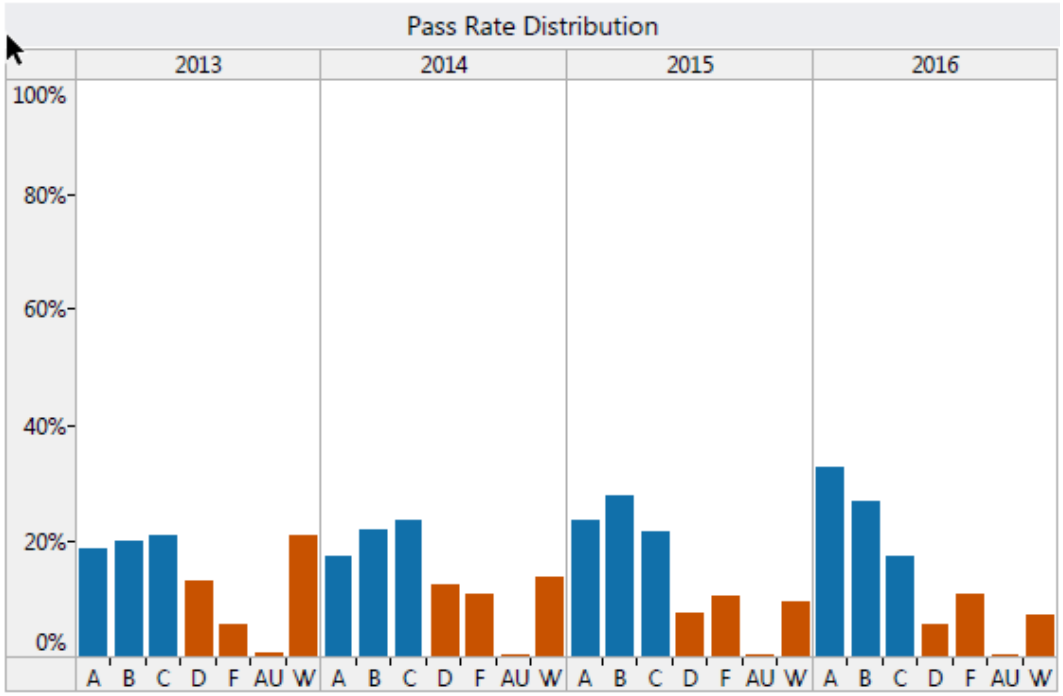
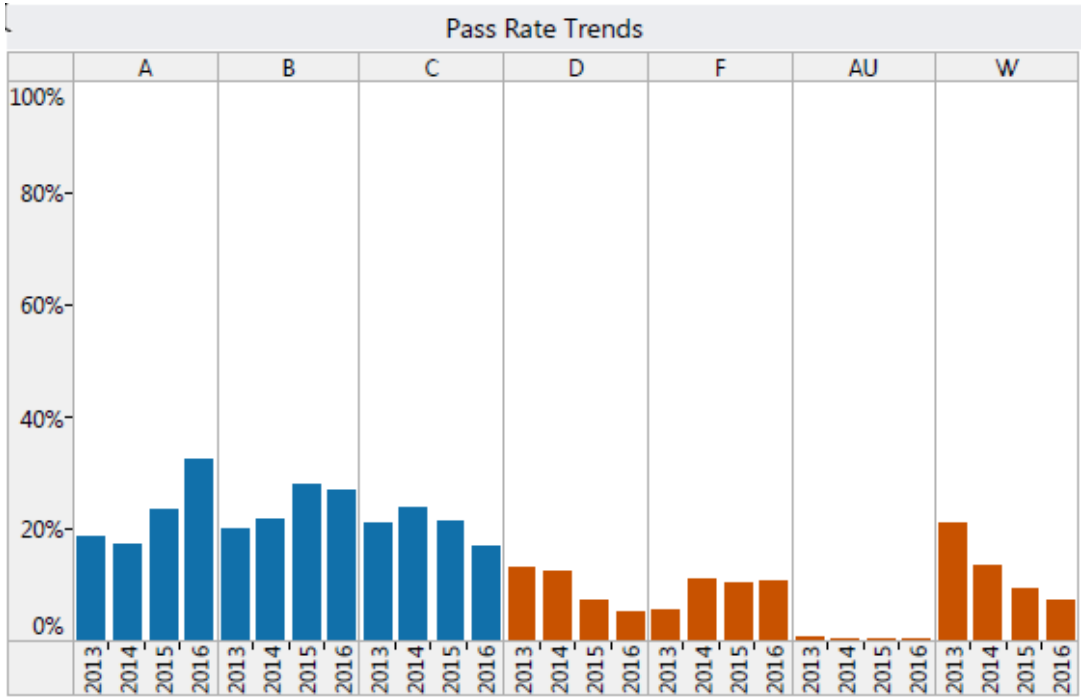


Exhibit IV.B: Course Retention – Student grades





- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps* Example: Relatively high success rates because student's assessment is based upon increased achievement, rather than full attainment of student learning outcomes. Achievements in Reading has been 10 points/percent higher than post-secondary remedial as a whole, however that can be attributed to the unique grading method.

The data suggest that the average course completion rates in chemistry are improving. This can likely be attributed to a change in full-time chemistry instructors that occurred starting with the 2015-2016 academic year. The course pass rate increased from 60% in 2013 to 76% in 2016. The course completion rate increased from 78% in 2013 to 92% in 2016. These data suggest that student pass rates, completion rates, and grades are improving. It is important to ensure that this increase in student grades is also accompanied by a matching increase in student learning outcomes. Certainly, one way of increasing student grades is to make the course easier, which would likely cause a decrease in student learning. Another way of improving student grades is to increase chances for practice and feedback, to ensure that learning expectations are clear, and to ensure that all necessary resources for learning are made available to the student; this would likely cause an increase in student learning.

The data suggest that the average course grades in chemistry are also improving. In the academic year 2013-2014, grades in chemistry courses were about 20% A, 20% B, 20% C, 20% withdraw, and 20% D, F, and audit. In the academic year 2016-2017, grades were 33% A, 27% B, 15% C, 8% withdraw, with less than 20% D, F, and audit. Whereas a grade of C was the most likely in 2013, a grade of A is most likely in 2016. Again, it is important to ensure that all increases in grades are accompanied by an increase in student learning outcomes.

A significant observation is that the number of students that withdraw from chemistry courses has decreased from over 20% in 2013 down to around 8% in 2016. Similarly, the number of A's and B's in chemistry courses has increased and the number of C's and D's in chemistry courses have decreased. The number of F's has remained relatively constant since 2013.

- **Plan**: To continue to increase course completion, pass rate, and student grades in the chemistry department:
  - Make student learning outcomes clear
  - Provide students with adequate resources to help them achieve learning outcomes
  - Provide students with ample opportunities for practice and feedback

    - **Indicator** (Completion rate and grades, measured by the 5-year average compared to current completion rate and grades)

      - **Threshold:** Green: Rate and grades Increase Yellow: Rate and grades Stagnate Red: Rate and grades Decline

V. Program Relevance (Programs need to address/Disciplines should address if they have a major emphasis that transfers.)

Exhibit V.A: Labor Market reports - OLMIS Reports Demonstrate Employment Opportunities

Chemistry

Regions	IPEDS Data	Associate	Bachelor
Nation	Degrees Conferred in 2015	830	15547
	Number of Institutions	169	1139
	Percent Change Since 2011	80%	13%
	Distance Education Programs	8	7
	Job Postings in Last 12 months	0	54055
Border States*	Degrees Conferred in 2015	561	2287
	Number of Institutions	65	107
	Percent Change Since 2011	96%	21%
	Distance Education Programs	0	0
	Job Postings in Last 12 months	0	9165
Oregon	Degrees Conferred in 2015	14	193
	Number of Institutions	3	14
	Percent Change Since 2011	1300%	28%
	Distance Education Programs	0	0
	Job Postings in Last 12 months	0	784

The *good news* and the *bad news* are evident here: wages are strong, but the projected annual new jobs across the nation are very low[3]. These projections are pulled from the state and federal employment agencies.

				Annual New Jobs		
Competitive Education	Occupation Title	Approx Wage#	South Coast*	South western*	State*	US#
Bachelor	Biochemical Engineers	$ 97,300		0	0	0.5
Bachelor	Chemical Engineers	$ 98,340			11	60.0
Bachelor	Chemists	$ 73,740			24	240.0
Bachelor	Natural Sciences Managers	$ 119,850		0	9	62.0
Doctorate	Astronomers	$ 104,740				0.0
Doctorate	Chemistry Teachers, Postsecondary	$ 76,750			7	410.0
Doctorate	Physicists	$ 115,870			2	140.0
Doctorate	Physics Teachers, Postsecondary	$ 84,570			5	270.0

* Oregon Employment Department's enhance projections over 2014-24 which included replacement jobs for Southwestern's region as a whole (Douglas, Coos and Curry Counties), Southcoast (Coos and Curry) and state-wide
# Bureau of Labor & Statistics 2014-24 projections for the nation

Groupings	Titles	Min#	Mean#	Max#	South Coast*	South western*	State*	Nation#
Nature	24	$ 35,560	$ 64,139	$ 119,850	6.4	19	617	3756
Science	88	$ 43,190	$ 81,469	$ 134,730	2.1	10	1233	13210
Chemistry	4	$ 73,740	$ 86,533	$ 98,340	0.0	0	43	710
Physics	4	$ 84,570	$ 106,258	$ 119,850	0.0	0	16	472

* Oregon Employment Department's enhance projections over 2014-24 which included replacement jobs for Southwestern's region as a whole (Douglas, Coos and Curry Counties), Southcoast (Coos and Curry) and state-wide
# Bureau of Labor & Statistics 2014-24 projections for the nation,

Nature Occupations (land management, food, agriculture, etc.)

Competitive Education	Occupation Title	Approx Wage#	Annual New Jobs South Coast*	South western*	State*	US*
Associate	Agricultural Technicians	$ 37,550	0		13	73.5
Associate	Food Science Technicians	$ 37,550	0		18	96.5
Associate	Forest and Conservation Technicians	$ 35,560	3	5	107	-180.0
Associate	Geological Sample Test Technicians	$ 56,470				131.2
Associate	Geophysical Data Technicians	$ 56,470				68.8

Science Occupations (omitting occupation data mentioned prior)

Competitive Education	Occupation Title	Approx Wage#	Annual New Jobs South Coast*	South western*	State*	US#
Associate	Environmental Engineering Technicians	$ 49,170			7	180.0
Associate	Environmental Science and Protection Technicians, Including Health	$ 44,190			16	340.0
Associate	Life, Physical, and Social Science Technicians, All Other	$ 46,040		0	3	17.3
Associate	Precision Agriculture Technicians	$ 46,040		0	1	5.6
Associate	Quality Control Analysts	$ 46,040		1	81	504.5
Associate	Remote Sensing Technicians	$ 46,040		0	0	2.6

- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps*

OLMIS is not applicable.

The fundamentals of Chemistry and Physics, particularly for lower division collegiate courses taught at Southwestern, continue to be foundations of all occupations that incorporate science.

Advantages:

- Some knowledge in both disciplines appear to have broad applicability to all science jobs or industries or organizations for focused on scientific products or services.
- The last 5 years have shown a dramatic increase in Associate's degrees awarded in Chemistry and Physics (*note: we cannot distinguish auto-awarding vs. other paths*).
- The earning power of chemistry, physics and other science occupations is typically comfortable middle class.

Concerns:

- Demand for the target occupations specifically associated with **Chemistry** and **Physics** are very low across regions. That puts an extra emphasis on curriculum being widely applicable to science occupations as a whole.
- Bachelor's degrees or above are overwhelmingly preferred in science occupations. Therefore, *transferability* of all credits and courses is particularly important for our students.

Skills Analysis: Because the job numbers were so low for occupations *directly* associated with Chemistry and Physics, as educational disciplines, we did not include a skills analysis. We can run that analysis on any set of targeted occupations. If you would like that analysis, then please identify your target occupations from the lists in the report and we can go forward. If you'd like to see that analysis with the target occupations for Chemistry and Physics, despite low projection numbers, we can do that, as well. Let me know your wishes.

Program Impact: We can do a more thorough dive into labor market applicability when advising trees are updated. That way, we can examine not only occupations directly associated with degrees in Chemistry and Physics, but also the occupations trained in programs at Southwestern that require some fundamentals in those areas. My understanding from a brief conversation with Robin Bunnell, is that advising trees show how courses in individual areas are required in credential programs -- example: CHEM 221 is required for our Forestry, Associate of Science program – and that our advising trees are not current, but in process.

- **Plan** (To investigate employment opportunities on the Southern Oregon Coast for students studying chemistry at SWOCC)
  - **Indicator** (Enrollment, measured by the 5-year average compared to current enrollment)
    - **Threshold:** Green: Employment opportunities Increase Yellow: Employment opportunities Stagnate Red: Employment opportunities Decline

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%

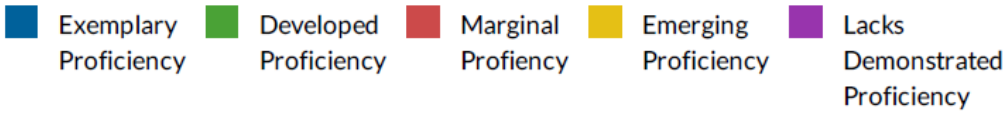
Plan:
I will continue to examine my teaching methodologies and exam and homework questions to improve these numbers.

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



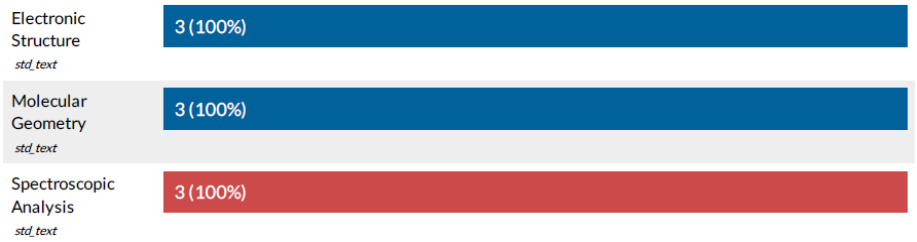
Rubric View: Chemical Structure Rubric **CHEM 110**

	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

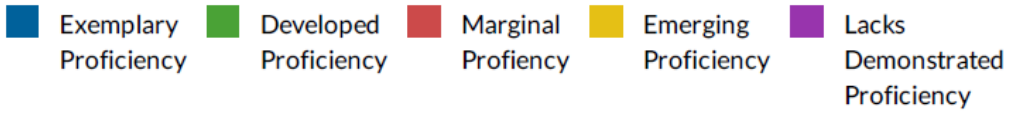
CHEM 110 GOAL:	WT17 RESULTS:
At least 75% of students achieve at least "emerging proficiency"	**88.5%** of students achieved at least "emerging proficiency"

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.

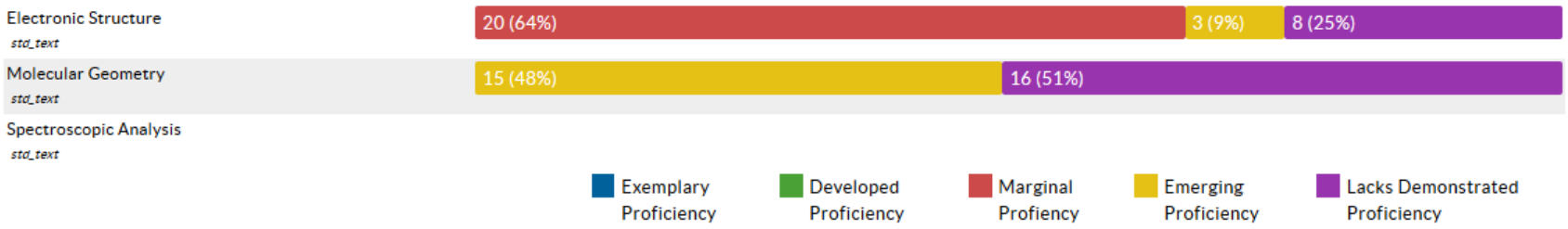
ANALYSIS: Although a majority of students scored at the desired level of performance in this exercise, I believe that there is more work to be done. I do believe that these data reflect the true abilities of my students in this category, as I have been sufficiently impressed with their understanding 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

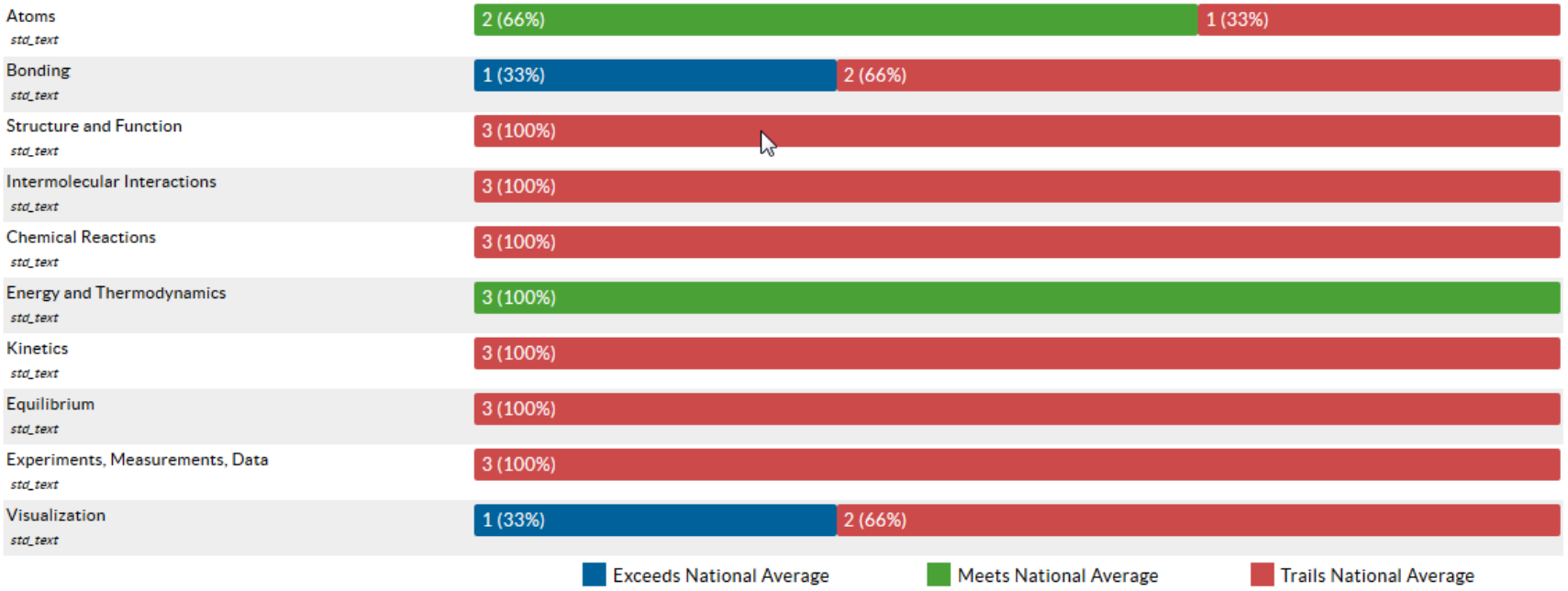
Rubric View: Chemical Structure Rubric

	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



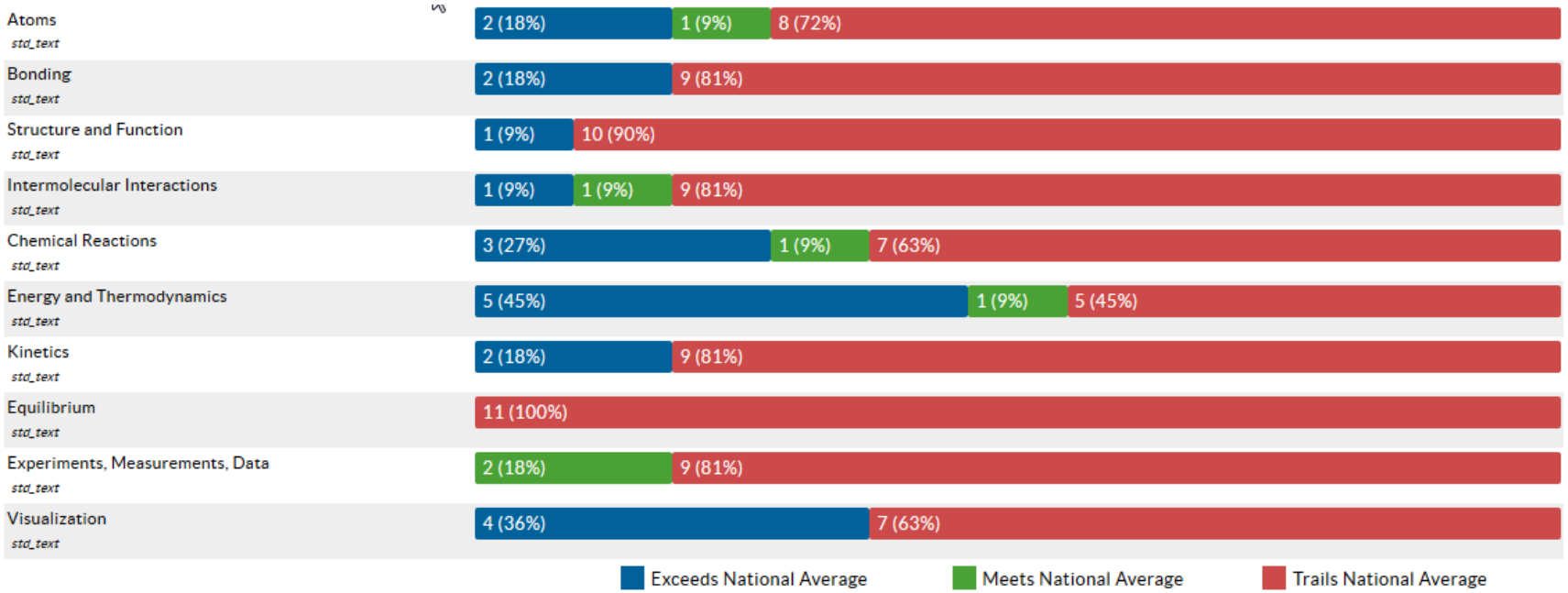
CHEM 110 GOAL:	**SP17 RESULTS:**
At least 75% of students achieve at least "emerging proficiency"	**60.5%** of students achieved at least "emerging proficiency"

CHEM 223-01



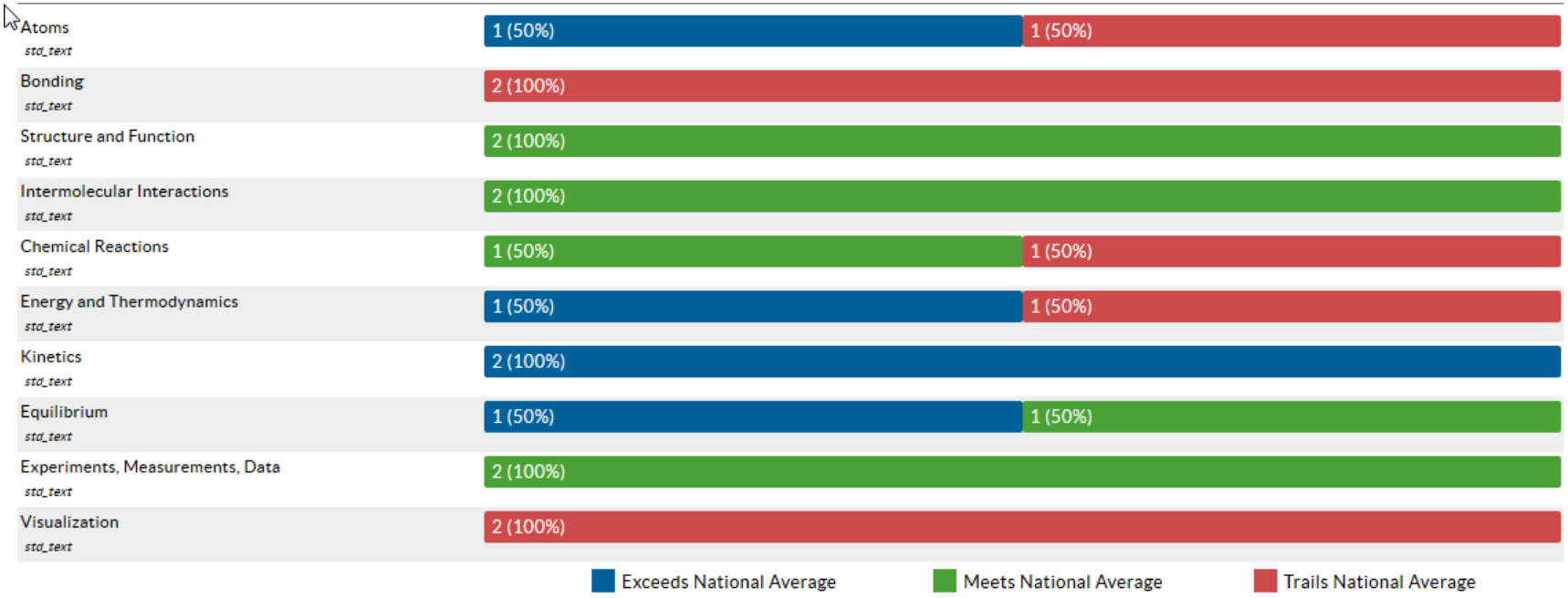
CHEM 223 GOAL:	**SP17 RESULTS:**
At least 75% of students achieve at least "meets national average"	**Many areas met national average, but many areas were trailing national average**

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%

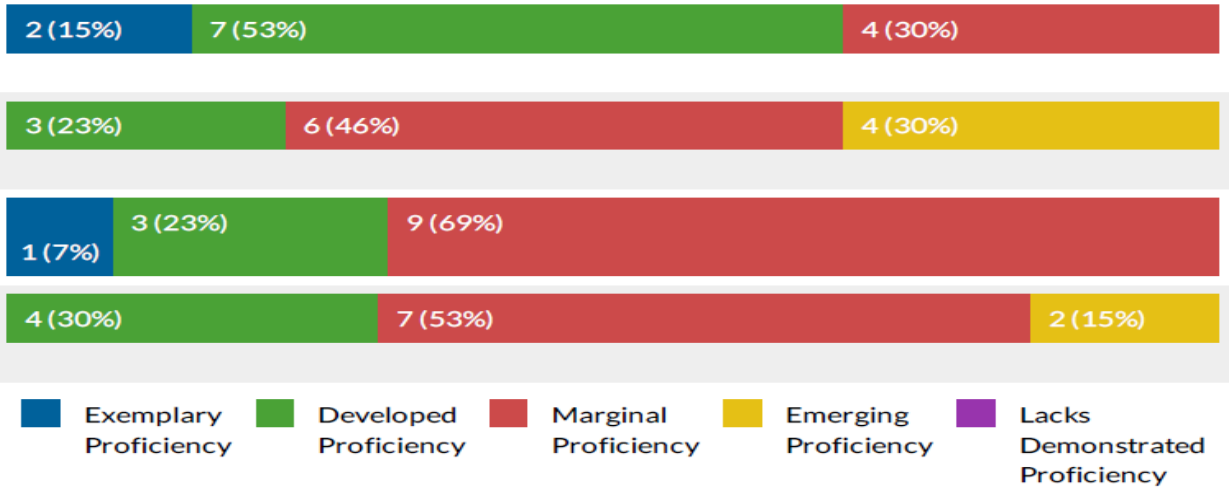
Analysis:
Average = 67.5%

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.

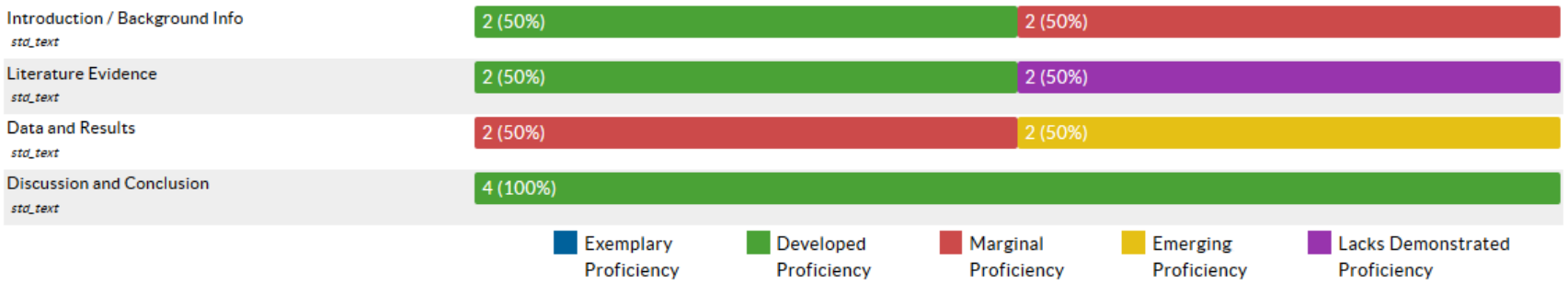
ANALYSIS: Although a majority of students scored above marginal proficiency in this exercise, I believe that there is more work to be done. My feeling is that students are not performing at the necessary level with regard to interpreting and analyzing experimental results; the fact that my data do not 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

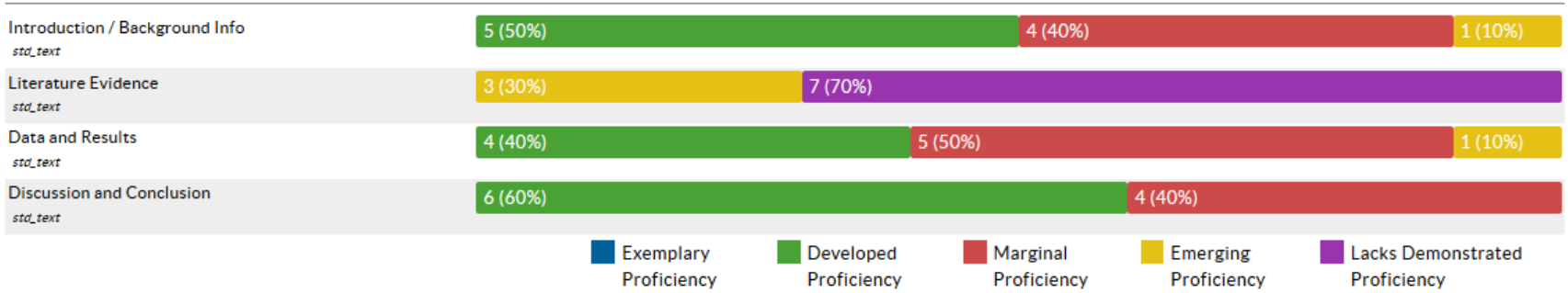
	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Proficiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Introduction / Background Info	0	2	2	0	0	2.500	2.000	0.500
Literature Evidence	0	2	0	0	2	1.500	0.000	1.500
Data and Results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

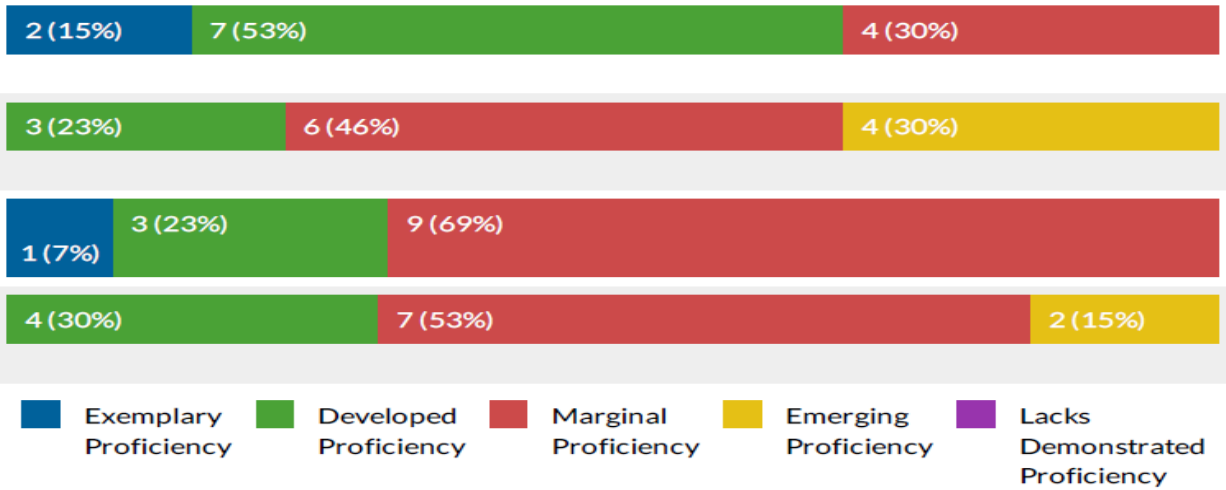
Outcome 5	Measureable Criteria	Measurement Tool	Courses	Time Frame
Information Literacy: Locate, summarize, and critique scientific articles, as well as synthesize scientific information from various sources to communicate the results of their own experiments.	At least 75% of students will achieve at 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.

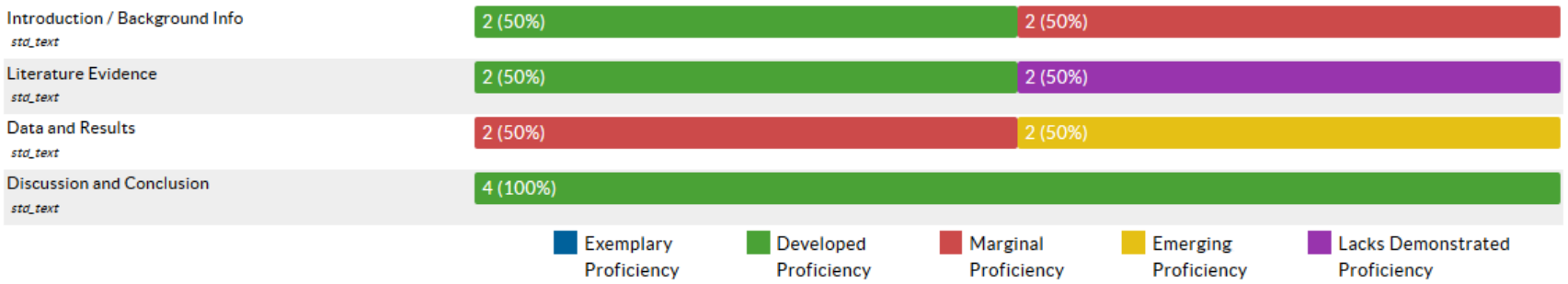
ANALYSIS: Since 100% of students were able to score at least "marginal proficiency" in the area of "introduction/background information", perhaps I should increase the expected performance level. It seems that 68% of students were able to score at least "developed proficiency" in this area. I will look 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

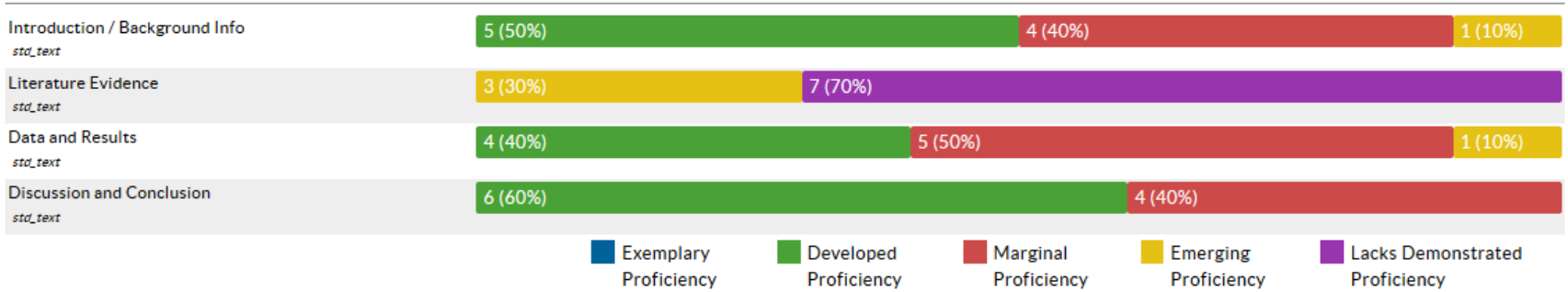
	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Proficiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	*Mean*	*Mode*	*Stdev*
Introduction / Background Info	0	2	2	0	0	2.500	2.000	0.500
Literature Evidence	0	2	0	0	2	1.500	0.000	1.500
Data and Results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

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.

PART D: Program Project Timeline – All Projects

Project Plan

Project	Core Theme Associated Plan(s)	Timeline Champion	Outcomes	Evaluation & Data
Project 1: Articulate AS in Chemistry to University of Oregon, Southern Oregon University, Eastern Oregon University, Western Oregon University, Portland State University, Oregon Health and Science University		**Owner/Lead:** Mike Springer **Start Date:** Upon completion of AS in Chemistry **End Date:** Spring2019	**Outcomes:** The successful implementation of this project will result in articulation agreements between SWOCC and as many other Oregon public universities as possible.	**Qualitative data:** articulation agreements will be obtained or some obstacle may prevent a formal agreement.

Project Activities	Timeline Champion	Resources and Impact	Stakeholders Collaboration	Project Status Update
Activity 1: Contact the chemistry departments of public Oregon universities	Mike Springer	No resources or negative impacts		
Activity 2: Obtain articulation agreements with chemistry departments at public Oregon universities	Mike Springer	No resources or negative impacts		

Project	Core Theme Associated Plan(s)	Timeline Champion	Outcomes	Evaluation & Data
Project 2: Improve student understanding of chemical quantitation		**Owner/Lead:** Mike Springer **Start Date:** In Fall 2017 **End Date:** On-going	**Outcomes:** The successful implementation of this project will result in scores on the American Chemical Society standardized exam in chemical quantitation that are at or above the national average	**Quantitative data:** Student scores on the ACS exam will be collected and analyzed

Project Activities	Timeline Champion	Resources and Impact	Stakeholders Collaboration	Project Status Update
Activity 1: Include more quantitative examples in lecture	Mike Springer	No resources needed or negative impacts foreseen		
Activity 2: Solve more quantitative problems, step-by-step, with the entire class during lecture	Mike Springer	No resources needed or negative impacts foreseen		
Activity 3: Increase the number and the difficulty of quantitative problems on the homework assignments	Mike Springer	No resources needed or negative impacts foreseen		
Activity 4: Increase the number and the difficulty of quantitative problems on the laboratory assignments	Mike Springer	No resources needed or negative impacts foreseen		
Activity 5: Increase the difficulty of quantitative problems on exams	Mike Springer	No resources needed or negative impacts foreseen		

Project	Core Theme Associated Plan(s)	Timeline Champion	Outcomes	Evaluation & Data
Project 3: Create student laboratory manuals for the general and organic chemistry sequences		**Owner/Lead:** Mike Springer **Start Date:** In Fall 2017 **End Date:** Fall 2020	**Outcomes:** The successful implementation of this project will result in the development of lab manuals that will utilize the chemical facilities at SWOCC, as well as save students money	**Qualitative Data:** Evaluation of the project will be based on the completion of lab manuals.

Project Activities	Timeline Champion	Resources and Impact	Stakeholders Collaboration	Project Status Update
Activity 1: Choose a collection of experiments that utilize the facilities of SWOCC and follow a coherent curriculum, including a progressive development of laboratory skills	Mike Springer	No resources needed or negative impacts foreseen		
Activity 2: Create a schedule of lab experiments for each sequence, at least 27 experiments each (9 experiments in each of three terms)	Mike Springer	No resources needed or negative impacts foreseen		
Activity 3: Locate and/or develop experimental procedures for each experiment	Mike Springer	No resources needed or negative impacts foreseen		
Activity 4: Author word documents with each procedure to avoid copyright infringement	Mike Springer	No resources needed or negative impacts foreseen		
Activity 5: Author pre-lab and post-lab activities for each experiment	Mike Springer	No resources needed or negative impacts foreseen		

Part E. Evaluation Plan – Link to surveys at SWOCC

The heart of the evaluation plan is "how will we know if our changes did what we thought they would?" *Indicators* define the statistics (counts, totals, etc.) on data that will be collected for the project to see the impact of the changes. But a simple number isn't enough to identify success. *Thresholds* identify the level or lack of success. The *baseline* is where you began before you implemented your change(s). These are the data-driven *rules* that are agreed to evaluate the project.

Determine how each outcome is measured. What tool or data set provides insight into the desired outcome? Choose between quantitative, qualitative or mixed data (both). What data is available and what additional data needs to be collected (i.e. survey, focus group, interviews). Work with the data team and IR to develop the evaluation plan and determine what data to collect.

Outcome	Indicator	Threshold	Baseline
Project 1: Articulate the AS in Chemistry to as many public Oregon universities as possible	The successful completion of this project will result in articulation agreements with as many Oregon public Universities as possible	**Green:** 100% of agreements obtained **Yellow:** Less than 100% obtained **Red:** 0% of agreements obtained	0%
Project 2: Improve student understanding of chemical quantitation	The successful implementation of this project will result in scores on the American Chemical Society standardized exam in chemical quantitation that are at or above the national average.	**Green:** Scores achieved are at or above the national average for chemical quantitation **Yellow:** Scores increase above 2017 student performance level, but remain below average **Red:** Scores remain at or below 2017 student performance level	2016 Student Performance on the ACS Exam
Project 3: Develop laboratory manuals for general and organic chemistry sequences	The successful implementation of this project will result in the development of lab manuals that will utilize the chemical facilities at SWOCC, as well as save students money	**Green:** Both lab manuals are developed **Yellow:** One lab manual is developed **Red:** No lab manuals are developed	No lab manuals have been developed

Timeline of Data Collection and Evaluation Activities

Data Collection and Evaluation Activities	Due Date	Champion	Completion Date
Project 1: Articulation Agreements between SWOCC chemistry and Oregon universities	Spring 2019	Mike Springer	
Project 2: Improve student understanding of Chemical Quantitation	Spring 2018	Mike Springer	
Activity 1: Include more quantitative examples in lecture	Spring 2018	Mike Springer	
Activity 2: Solve more quantitative problems, step-by-step, with the entire class during lecture	Spring 2018	Mike Springer	
Activity 3: Increase the number and the difficulty of quantitative problems on the homework assignments	Spring 2018	Mike Springer	
Activity 4: Increase the number and the difficulty of quantitative problems on the laboratory assignments	Spring 2018	Mike Springer	
Activity 5: Increase the difficulty of quantitative problems on exams	Spring 2018	Mike Springer	
Project 3: Create laboratory manuals for general and organic chemistry sequences	Fall 2020	Mike Springer	
Activity 1: Choose a collection of experiments that utilize the facilities of SWOCC and follow a coherent curriculum, including a progressive development of laboratory skills	Fall 2018	Mike Springer	
Activity 2: Create a schedule of lab experiments for each sequence, at least 27 experiments each (9 experiments in each of three terms)	Winter 2018	Mike Springer	
Activity 3: Locate and/or develop experimental procedures for each experiment	Spring 2018	Mike Springer	
Activity 4: Author word documents with each procedure to avoid copyright infringement	Spring 2020	Mike Springer	
Activity 5: Author pre-lab and post-lab activities for each experiment	Spring 2020	Mike Springer	

Southwestern Program Review
Writing Program

Process

Program Review is a continuous process of collecting, evaluating, and using information to determine if and how well performance matches learning or service outcomes which occurs on at least a triennial basis. We gather evidence of student learning; discover the degree to which courses, programs, and administrative and educational support services accomplish intended outcomes; and probe the achievement of institutional projects, core themes, and mission. Southwestern conducts program reviews of all programs and services on a quadrennial basis (every 4 years) and uses the results of the assessments to enhance and improve current programs and services.

Resources

Program Review detailed instructions
Report Documentation – myLakerLink on the Resource Center tab
Reports – must be on campus or access network to process reports
Course Completion Report
Course Completion by Course Report
Course Completion by Degree Report
Course Enrollments Report
GL Unit Costs by Fund by Unit Report
Graduates by Major Report
OLMIS – Employment Opportunities
Persistence Report – being developed
Student Enrollment Report – Enrollments, FTE, Billing Credits
Transfer Reports – being developed

Program review consists of the following elements

- ✓ Program Description and Goals / Philosophy
- ✓ Program Narratives
- ✓ Student Learning Outcomes including measures and criterion for achievement
- ✓ Operational Data analysis
  - I. Enrollments
  - II. Financial Viability
  - III. Efficiency of Delivery
  - IV. Instructional Effectiveness
  - V. Program Student Success
  - VI. Program Relevance
  - VII. Graduate Student Success
- ✓ Reflection of the data
- ✓ Projects planned based on evidence
- ✓ Association with core themes and other planning, processes/projects
- ✓ Activity Timeline

All reports are available within myLakerLink and are located on the Resource Center tab. Links to all reports are located within each section title of this document. Program Review requirements for certain sections include multiple reports with additional links to the reports located within the specific section of the report.

PART A: Program Review Narratives

Program Description and Goals / Philosophy

- The Writing Program supports writing and content area courses by improving student writing through instruction, critique, and practice. We prepare students for writing and content courses at the college, at four-year institutions, and for writing in the workplace. We strive to help students become confident, successful writers.

Administration

- **Faculty / Staffing:** We currently have five full-time faculty, one visiting faculty, and about nine part-time faculty. Since the last review, the Writing and English Department faculty have had another retirement and our department remains at about half the size it was ten years ago. One full-time faculty may be retiring within the review cycle.

- **Professional Development** Faculty participate in college-wide professional development opportunities. The department monitors the website communications of the state-wide advisory group OWEAC and occasionally sends a representative to quarterly state-wide meetings. Two full time faculty have participated in the Pacific Northwest Great Teaching Seminar. Several faculty members are considering joining NCTE and CCC.

- **Support Services used (or identified need):** The college supports the Writing Center, with approximately 30 hours per week staffed by faculty and tutors, to assist students with writing. Gradebooks are available to students online, and students are alerted at mid-term if they are failing a course. The college has implemented LakerConnect for early grade reports and general concerns about student welfare.

- **Advisory Committee (activities and membership):** N/A

- **Community Relationships / Partnerships:** The college hosts the South Coast Writer's Conference on the Gold Beach Campus each winter. Faculty participate in the Oregon Author's Day and will help judge the high school fiction and poetry contest. Faculty also volunteer on their own time in a variety of settings.

- **Program Accreditation (if applicable):** N/A

Curriculum

- **Degrees/Certificates offered and changes since last review**: N/A
- **Course list and changes since last review, including new and revised courses:** We are piloting courses that focus on reading (WR90R) and a supplemental, concurrent course for WR 121 (WR 95). The Developmental Education program has been streamlined, with some credits eliminated, so that students can complete in fewer credits at a lower cost; our research shows that this improves achievement and completion of the writing sequence.
- **Career Pathway/Program of Study Efforts:** N/A
- **Delivery Methods/Instructional Methodology:** We offer daytime, evening, and online courses. The department is evaluating how best to use hybrid courses.
- **Articulation/Transferability:** We continue to assess how effectively our courses align with Oregon community colleges and universities. Although our efforts have been consistent, we have determined through scheduled course outline updates, regular program reviews, and the SWOCC Outcomes Assessment Process, that we will be more purposeful and timely in our alignment verifications.
- **Dual Credit offerings:** We currently offer WR 121, WR 122, English 104, and English 105 at local high schools for dual credit, serving about 250 students per term. The high school instructors are mentored by full time faculty.
- **Course Scheduling issues:** Compared with our past offerings, we have limited staffing. We do offer enough writing courses in the evening and online that students could attain a degree without attending in the daytime.
- **Instructional Materials (textbook, software issues):** Faculty use a combination of textbooks and faculty-generated instructional materials for face-to-face and online courses using the eLearning platform. Several faculty do not use textbooks, preferring to create course material at no cost to students. Faculty have consistently argued against common textbooks, citing the need for individual choice, and the high price of textbooks. Some faculty are experimenting with OERs.

Students

- **Special Populations:** There is no evidence to show any recent changes to the student population, in preparedness or ability.
- **Recruitment** Recruitment is not necessary as writing courses are mandatory in all degree programs. With the objective of recruiting and retaining high achieving students, one faculty member developed an honors program for the English Department and has expanded that to the college wide curriculum. Faculty members continue to advertise and promote our course offerings.
- **Advising:** The department has implemented a new placement program based on multiple measures. The writing department and Southwestern are actively participating in a state-wide community college task force to address placement, including writing placement.
- **Student Satisfaction:** Student ratings, through course scheduled course evaluations and through the scheduled faculty review process, show overall satisfaction with courses and instructors. For example, the writing program rating of instruction is 4.10, slightly lower than the college rating of 4.26, which still indicates a high level of satisfaction.
- **Student Assessment Methods:** Student work is assessed according to best practices for the profession, in line with OWEAC standards. Writing is assessed for content, organization, language, and error issues, using rubrics. We are participating in the Multi-state Collaborative to Advance Learning Outcomes Assessment pilot study, which gave us information on our grading and assessment methods. Our students have been scored at 1.96; 2.0 is sophomore level, so our students are where they should be academically. The department will be participating in grade norming sessions as part of the assessment initiative.

Facilities/Budget

- **Budget Changes over past 4 years:** There has been very little change in the budget since the last review.
- **Instructional Materials (software, supplies, etc.):** One faculty is piloting a reading and learning software program with the new WR 90R class. The department is working with the library to redesign the Literacy Modules that accompany the writing sequence. One faculty is evaluating the efficacy of the Writing Center services; the department will be revamping the center to better serve our students.
- **Equipment lists and needs:** There is a small but ongoing need for replacement of computers and printers. Remote offices need better access to copiers at varying times of day.
- **Facilities lists and needs:** There is a college-wide discussion about the purchase and use of plagiarism software. All instructors need keys to the buildings and classrooms in which they teach, especially those who teach early or late classes.
- **Student fees** N/A

Progress of Planned Projects

- The college is still participating in the Multi-state Collaborative to assess student progress. We collected artifacts from across the campus and these were evaluated by the committee. Our students have been scored at 1.96; 2.0 is sophomore level, so our students are where they should be academically.

PART B: Program Outcomes Data Review

Student Learning Outcomes - Measures - Criteria

List program outcomes; include the means of assessment and assessment threshold criteria:
In 2014, the Writing Department determined its writing discipline student learning outcomes.

Students will accomplish the following:

- Use multiple writing strategies in order to explore, clarify, and effectively communicate ideas to appropriate audiences.
- Demonstrate consistent use of conventions particular to a specific writing task including organization, content, presentation, and stylistic choices.
- Incorporate critical thinking at all steps in the writing process.
- Write effectively for diverse audiences within a specific area or discipline using appropriate standards and conventions.

Review measurement data for the full four-year cycle
During fall 2015, the Writing Department began implementing the seven steps of the Student Learning Outcomes Assessment Plan.

1. **Map courses to Program/Discipline Outcomes.** The writing department has identified which courses meet which Writing Discipline Outcomes, and they have determined that each course does meet each of the Writing Discipline Outcomes**.**

2. **Map Program/Discipline Outcomes to General Student Learning Outcomes.** Southwestern has five General Student Learning Outcomes divided into the following areas: Communication; Computation; Creative, Critical, and Analytical Thinking; Community/Global Consciousness and Responsibility; and Discipline Content. The writing department has identified which Writing Discipline Outcome addresses which General Student Learning Outcome. The Writing Department also indicates which Writing Discipline Outcome introduces, reinforces, or measures the proficiency of the General Student Learning Outcome.

3. **Map assessment tools to Program/Discipline and Course Outcomes.** The Writing Department mapped the multiple assessment tools within the writing courses that contribute to assessing both the Writing Discipline Outcomes and General Student Learning Outcomes. A sampling of these outcomes include discussion, peer review, in-class writing, self-evaluation, assignment rubrics, workplace documents, academic documents, journals, and quizzes.

4. **Develop measurable tools and criteria for each Program/Discipline Outcomes.** The Writing Department is developing measurable tools and criteria for each Discipline Outcome. Two examples demonstrate models as patterns for scaled up department assessments. One model represents a faculty member's class assignment that measures students' learning for the specific Writing Discipline Outcome 2. The two reports provided for this assessment evaluates student development and success, makes suggestions for and adjustments to assignments, and tracks the implementation of those adjustments over two terms of instructions. This is an ongoing, evolutionary process that will improve instruction and student success. The second model represents the department's united assessment of the specific Writing Discipline Outcome 2 including inter-rater reliability. Both the faculty member and the Writing Department have identified a measurable criteria for Writing Discipline Outcome 2: "A threshold of 80% of students will receive a C or better demonstrated with a minimum Level 3 on the criterion Context and Purpose of Writing and Content Development for the Written Communication VALUE rubric. Level 3 criteria for Purpose and Content Development include writing that demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task by using appropriate, relevant, and compelling content to explore ideas within context of the discipline and shape the whole work."

   The individual faculty member assessed an expository essay with an assigned topic as a summative assignment that served as the final for WR 121 during the winter and spring terms of 2017. The Writing Department also assessed a sampling of 41 WR 123 essays collected Spring 2017 in connection with the Multi-State Collaborative to Advance Learning Outcomes Assessment project.

5. **Record measurement data.** The faculty member and the Writing Department have recorded the following data collected from their measurable tools for Writing Discipline Outcome 2.

6. **Analyze measurements data and verify benchmarks.** The faculty member and the Writing Department have analyzed the data collected from their measurable tools to Writing Discipline Outcome 2.

7. **Adjust outcomes and curriculum as necessary—at course and/or program/discipline level.** The faculty member and the Writing Department have adjusted either the outcome or the curriculum based on data collected from their measurable tools to Writing Discipline Outcome 2 as described on the Program Assessment Report Form.

The Writing Department continues to implement course and program assessment using the Student Learning Outcomes, course, and program rubrics to improve instruction and student success. They have provided an example of assessing Outcome 2. Assessments and work need to be done on the remaining discipline outcomes.

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.	The goal set was that 70% of students show Marginal Proficiency.	Final Topic Essay: Position Essay	WR 121 07 English Composition	Winter 2017

Rubric View: Writing Rubric

	Exemplary (4 pts)	Marginal (3 pts)	Emerging (2 pts)	Lacks Demonstrated Proficiency (1 pts)	Mean	Mode	Stdev
Context of and Purpose for Writing	0	9	13	0	2.409	2.000	0.492
Content Development	1	10	11	0	2.545	2.000	0.582
Genre and Disciplinary Conventions	0	10	12	0	2.455	2.000	0.498
Sources and Evidence	0	11	11	0	2.500	2.000	0.500
Control of Syntax and Mechanics	0	13	8	1	2.545	3.000	0.582

	Exemplary (4 pts)	Marginal (3 pts)	Emerging (2 pts)	Lacks Demonstrated Proficiency (1 pts)	*Mean*	*Mode*	*Stdev*
Sources and Evidence	0	11	11	0	2.500	2.000	0.500

RESULTS: As seen in the graph, 50% of the class was assessed at Marginal Proficiency, and the remainder of the class was assessed below the desired expectation.

ANALYSIS: The assignment was to write an argumentative or position essay on the theme of Sherman Alexie's essay "The Joy of Reading and Writing: Superman and Me." The student was to take a stance on the central theme of Alexie's essay and defend that stance with supporting evidence from the essay. The evidence must have been cited within the essay and documented on the Works Cited page, and a thorough explanation of the evidence was expected. Demonstrating strategies for collecting information and supporting ideas is one of the culminating outcomes for WR 121. Presenting credible evidence in support of an opinion or idea is one possible option for demonstrating the skill. This convention should have been used in at least two of the previous essays during the term. Half the students demonstrated Marginal Proficiency. This did not meet the goal of 70%.

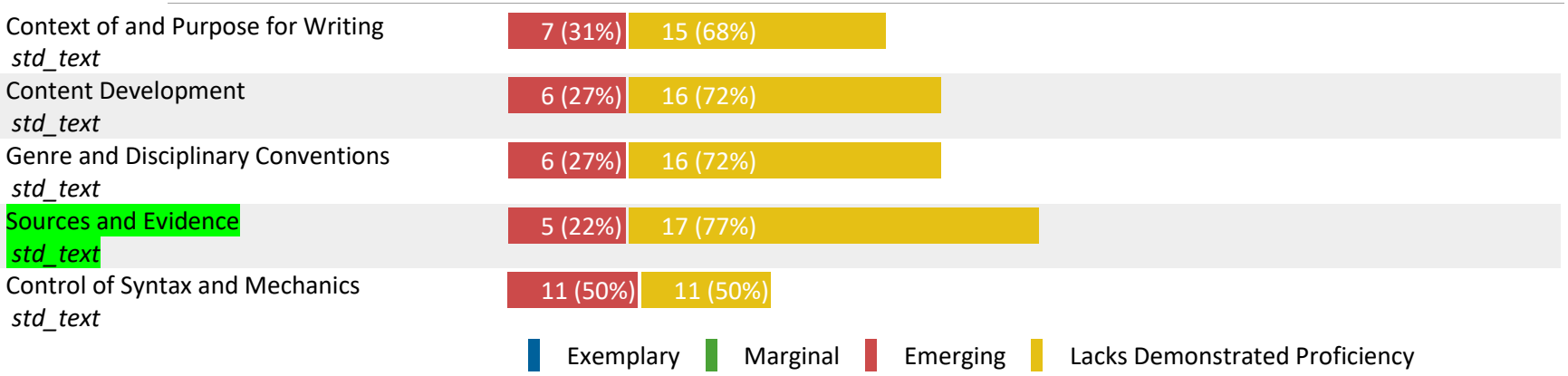
PLAN: I feel that this assignment effectively targeted this outcome. I also believe that having the one option for the final essay was more effective than presenting the students with multiple writing prompts and allowing the students to select the final topic from the pool of options as was done in previous terms. This one option allowed for specific and productive discussion about essay structure and supportive evidence before the writing assignment was due. Meaning, the students engaged in an in-depth discussion about the theme of the essay and argued why they believed the essay was about that particular concept. It was a very productive moment for the class. Next term, I will repeat this for each essay—including the Final Topic Essay—as I believe most students who participated were able to define a position on the theme during the guided, in-class invention process.

Most of the students who failed to meet the Marginal Proficiency on this assignment either did not include the in-text documentation as was expected or failed to explain thoroughly the point of the evidence and how that evidence helped defend the argument being presented. Next term, I will assign readings for each of the major essay concepts and conduct guided, in-class discussions on those reading assignments. Each of the major essay assignments will be on the topic of those readings. Hopefully, the discussions will enable the students to develop supportive positions on the ideas central to the student essays. I will also spend more time early in the term discussing in-text documentation and the conventions that will help the students cite the evidence correctly.

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.	The goal set was that 50% of students show Marginal Proficiency.	Final Topic Essay	WR 121 05 English Composition	Spring 2017

Rubric View: Writing Rubric

	Exemplary (4 pts)	Marginal (3 pts)	Emerging (2 pts)	Lacks Demonstrated Proficiency (1 pts)	*Mean*	*Mode*	*Stdev*
Context of and Purpose for Writing	0	0	7	15	1.318	1.000	0.466
Content Development	0	0	6	16	1.273	1.000	0.445
Genre and Disciplinary Conventions	0	0	6	16	1.273	1.000	0.445
Sources and Evidence	0	0	5	17	1.227	1.000	0.419
Control of Syntax and Mechanics	0	0	11	11	1.500	1.000	0.500



RESULTS: As seen in the graph, 22% of the class was assessed at Emerging Proficiency, and the remainder of the class was assessed below the desired expectation.

ANALYSIS: The assignment was to write either an argumentative or informative essay on the topic of Colony Collapse Disorder as presented in the *Time Magazine* article "The Plight of the Honeybee" by Bryan Walsh and discussed in the first two chapters of Lori Weidenhammer's book *Victory Gardens for Bees: A DIY Guide to Saving the bees*. The student work was assessed on the course objectives of adapting the content and purpose of the essay to the audience, essay organization, and on the productive use of supporting evidence and its explanation. Presenting credible evidence in support of an opinion or idea is one possible option for demonstrating much that was expected from this summative assignment. This convention should have been used in at least two of the previous essays during the term. Fewer than a quarter of the students demonstrated an Emerging Proficiency. This did not meet the goal of 50% of the class being assessed at an Emerging Proficiency. Note: I have adjusted the expectation of success from the Winter Term in marking the rubric and analyzing the results to align with the modified understanding of the departmental rubric, which uses the value rubric's understanding of assessing a student's progress toward a four-year degree. I have scaled back my understanding of success in the analysis of the data as well so the expectation is more realistic to the skills of my students and my development of the curriculum to meet their needs. My goal of course is near 100% success as the curriculum evolves.

I feel that this assignment effectively targeted this outcome. I also believe that the students had adequate preparation for the skill of using evidence in support of an opinion as all but one of the essays required this convention within each body section of the essays previously written. Also, the in-class discussion of the final essay focused heavily on this idea of using evidence from the two possible sources in support of the thesis and main points of the essay. Specifically as a class, I had the students target evidence from the reading that would support an agreed upon claim the class suggested. Once a student suggested a piece of evidence, I had the class discuss how that evidence supported the claim. The work was the verbal representation of the written expectation for the final. This point was made during the review session discussion. The problem, I believe, resides in the fact that only about a third of the class attended the review session, and of that third, only about half of those students self-reported that they had read the material; meaning, at the time of the review, less than a quarter of the students had prepared for the review and the final writing assignment.

PLAN: In the fall, I will limit the readings for the major essays to one source per essay, so that a more direct focus can be made on the idea of supporting data: data that supports a claim. I think that my students may have been overwhelmed by the amount of content that I expected them to consume before writing about a concept. In the past, I had the students choose a concept to write about and find evidence to support a claim. I moved away from the self selection of a topic because many of my student spent most of their time deciding on a topic and less time researching the topic, which would provide them with evidence for support. By focusing the readings to one source, it will more directly relate to how the final performed this term. Hopefully, the repetition of the simplified process will help the students understand the academic essay structure more fully. Also, I will be able to increase the number of essays written in the term by at least one essay, possibly two. It will also allow for a discussion of varied essay conventions.

As in the Winter Term, most of the students who failed to meet the Marginal Proficiency on this assignment either did not include the in-text documentation as was expected or failed to explain thoroughly the point of the evidence and how that evidence helped defend the argument being presented. Next term, I will focus the content readings to one per major essay as stated earlier. Hopefully, the discussions will be less about the concept presented within the readings and more on processing the content for use in an essay. I will also be able to demonstrate the documentation expectation more thoroughly because more time can be spent on the material with fewer readings.

Also, since the assessment of demonstrating this skill falls on the final—one summative assignment—I will spend time relating each exercise during the term to this end goal, and I will attempt to free up the final week of the term, week ten, so that the class may focus on the readings and essay discussion over more than one day. I will have them complete a written analysis of the reading and develop a written outline for the final essay, and I will incorporate these two writing assignments in the grade for the final. This activity will not only prepare them to write the type of essay I want for the final, but it will also directly relate to the recursive writing outcome detailed in the course syllabus.

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.	*A threshold of 80% of students will receive a C or better demonstrated with a minimum Level 3 on the criteria Context and Purpose of Writing and Content Development for the Written Communication VALUE Rubric. Level 3 criteria for Purpose and Writing and Content Development include writing that demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task by using appropriate, relevant, and compelling content to explore ideas within context of the discipline and shape the whole work.*	• *Writing 123 student writing assignments gathered through the Multi-State Collaborative Assessing Student Learning Outcomes project.*	• WR 123	• Spring 2017

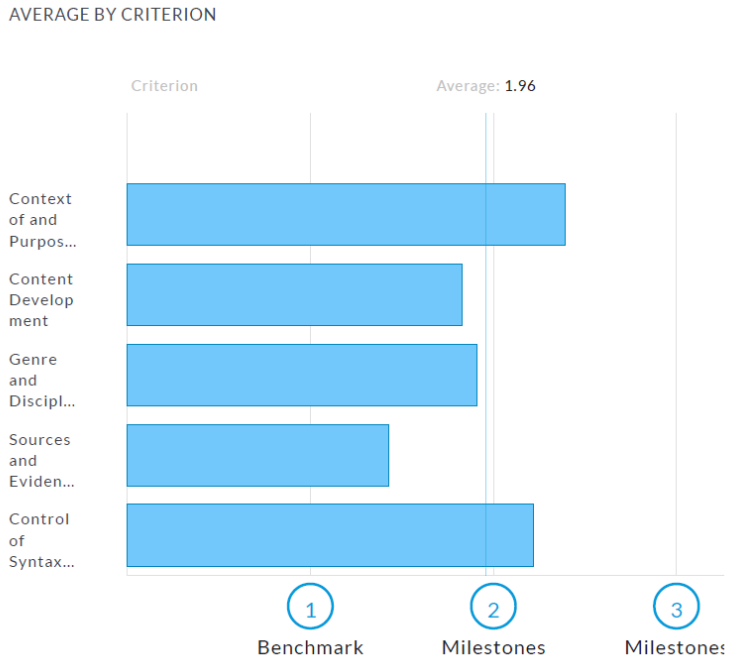
Results: See graphs below.

Analysis: The Multi-State Collaborative to Advance Learning Outcomes Assessment (MSC) is an initiative designed to provide meaningful evidence about how well students are achieving important learning outcomes. The initiative foregrounds a distinctly different form of assessment than the traditional standardized test. Instead of producing reports about average scores on tests, the project is piloting the use of common rubrics applied by teams of faculty to student' authentic college work—including such things as projects, papers, and research. The MSC is designed to produce valid data summarizing faculty judgments of students' own work, and also seeks to aggregate results in a way that allows for benchmarking across institutions and states. The primary goal of the initiative is to provide assessment data that will allow faculty and institution leaders to assess—and improve—the levels of student achievement on a set of cross-cutting outcomes important for all disciplines.

Southwestern is one of three community colleges in Oregon participating in the MSC project. During Spring 2017**,** Southwestern faculty contributed by identifying spring term assignments that involved writing, providing brief descriptions of assignments, and providing copies of ungraded student writing assignments. The 41 student writing samples were randomly selected from the WR 123 sections participating in the MSC project.

In the areas of Context of and Purpose for Writing and Control of Syntax, we are above the first milestone and be slightly below in the areas of Content Development and Genre and Discipline. We are above the benchmark but below the first milestone in the area of Sources and Evidence. This tells us to increase the emphasis on utilizing sources in our WR 123 courses.

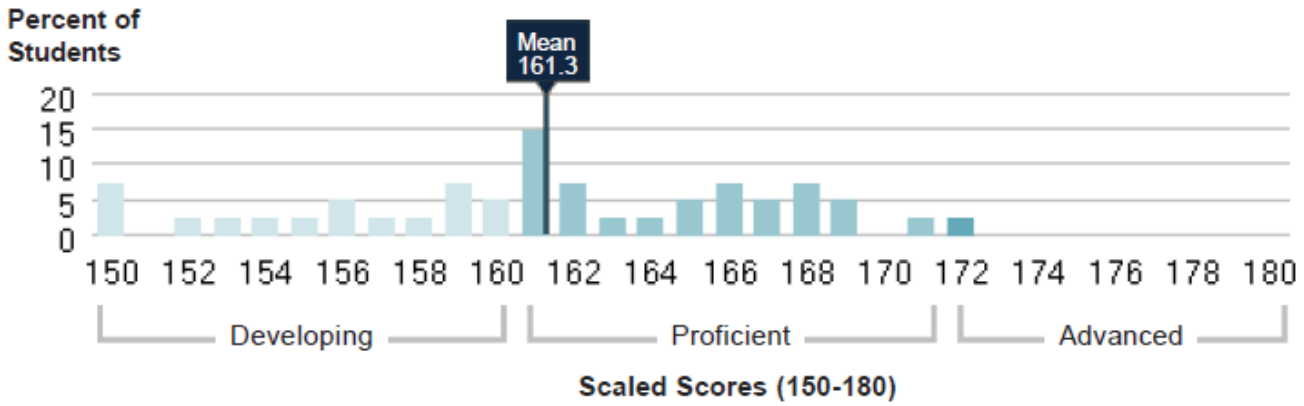
Plan: As a method of gathering essays for assessment, the MSC project has worked well for us. Even though we focused on writings from WR 123, the samples represented multiple assignments. This process allowed us to examine the criteria through multiple writing genres and activities. These assignments and measurement tool reveal that students understand and demonstrate context, audience, purpose, and content development. However, in all writing classes but specifically in WR 123 additional direct instruction and writing examples are necessary to prepare students to demonstrate skillful use of high-quality, credible, relevant sources and examples to develop ideas that are appropriate for the discipline and genre of the writing.



INDIVIDUAL STUDENTS' OVERALL SCALED SCORES

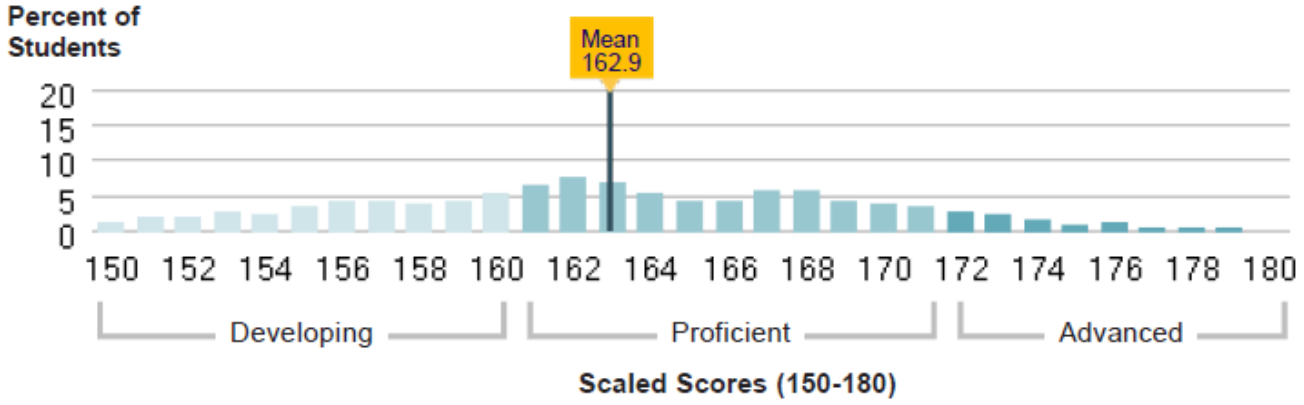
The histograms below show the distribution of individual students' scaled scores within the Reporting Group and the Comparison Group. The dark line indicates the overall mean score for that group.

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



PART C: Program Operational Data Review

I Course Listing Passing Status

- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps*
  - The WR 90 and WR90R classes passing rate is in the mid-70s up from the low 60s. So, the redesign of WR 90 is clearly improving student success.
  - WR 95 is a new and unique course and the data is insufficient at present to form a conclusion. This will be explored in the next program review.
  - WR 122 and WR 123 pass rate is in the low 80s, so student success is on target for our goals of 80% passing.
  - For WR 121, the pass rate is around 70%.
- **Plan:** *Respond to the data evidence – how will the data results be utilized to enhance and improve graduate student success within the program, list specific planned projects*
  - Addressing the WR 121 success rate, the department is assessing the course content and objectives and how best to improve student success. This process is directly linked to our college wide assessment initiative. The goal is still 80% completion.

Course Listing Passing Status

Course	Status	Enrollment Count				% of Total Enrollments				FTE Reimbursable			
		2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
WR 115	Passing	89	75	75	71	73%	84%	77%	72%	6	5	4	5
	NonPassing	33	14	22	27	27%	16%	23%	28%	2	1	1	2
	Total	**122**	**89**	**97**	**98**	**100%**	**100%**	**100%**	**100%**	**8**	**6**	**6**	**6**
WR 121	Passing	378	346	374	424	71%	69%	75%	70%	25	22	24	27
	NonPassing	151	156	123	178	29%	31%	25%	30%	9	10	8	11
	Total	**529**	**502**	**497**	**602**	**100%**	**100%**	**100%**	**100%**	**34**	**32**	**32**	**38**
WR 121H	Passing				1				100%				0
	Total				**1**				**100%**				**0**
WR 122	Passing	298	278	284	294	78%	82%	82%	80%	19	18	18	19
	NonPassing	85	63	61	74	22%	18%	18%	20%	5	4	4	4
	Total	**383**	**341**	**345**	**368**	**100%**	**100%**	**100%**	**100%**	**24**	**22**	**22**	**23**
WR 122H	Passing				2				100%				0
	Total				**2**				**100%**				**0**
WR 123	Passing	200	177	194	191	72%	74%	81%	83%	13	11	12	12

Enrollment Count, % of Total Enrollments and FTE Reimbursable broken down by Year vs. Course and Status. The data is filtered on Division, ActivityCode, Grade, Program Areas, Term, CollegeNowStudent, Operational Areas, Graduated, TransferNoGrad, Cohort Category, CohortCode, CohortEntryAgeGroup, Gender, Location, Section, Subject, TimeDay, OnCampusHS_Student and Dual_EnhancedOptions_Students. The Division filter keeps ETS, Community Education, Events, Other College and UG. The ActivityCode filter keeps LDC, CTE Prep and PSR Writing/Reading. The Grade filter keeps 19 of 19 members. The Program Areas filter keeps Writing Gateway and Writing LDC. The Term filter keeps Fall, Spring, Summer and Winter. The CollegeNowStudent filter keeps Null and Y. The Operational Areas filter keeps Family Center and Other. The Graduated filter keeps Null, N and Y. The TransferNoGrad filter keeps Null, N and Y. The Cohort Category filter keeps Null, Full Time First Time, Full Time Transfer, Part Time First Time and Part Time Transfer. The CohortCode filter keeps 105 of 105 members. The CohortEntryAgeGroup filter keeps 12 of 12 members. The Gender filter keeps Null, , F, M and N. The Location filter keeps Null, Curry, Main and Online. The Section filter keeps 10,830 of 10,847 members. The Subject filter keeps 98 of 98 members. The TimeDay filter keeps Null, Day, Evening and Online. The OnCampusHS_Student filter keeps N and Y. The Dual_EnhancedOptions_Students filter keeps N. The view is filtered on Year, Course and Status. The Year filter keeps 2013, 2014, 2015 and 2016. The Course filter keeps 1,386 of 1,397 members. The Status filter keeps Null, Audit, Non Graded, NonPassing and Passing.

Course Listing Passing Status

Course	Status	Enrollment Count				% of Total Enrollments				FTE Reimbursable			
		2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
WR 123	NonPassing	78	62	45	39	28%	26%	19%	17%	5	4	3	2
	Total	**278**	**239**	**239**	**230**	**100%**	**100%**	**100%**	**100%**	**18**	**15**	**15**	**15**
WR 199C	Passing	10				77%				1			
	NonPassing	3				23%				0			
	Total	**13**				**100%**				**1**			
WR 227	Passing	37	87	64	77	80%	91%	91%	89%	2	6	4	5
	NonPassing	9	9	6	10	20%	9%	9%	11%	1	1	0	1
	Total	**46**	**96**	**70**	**87**	**100%**	**100%**	**100%**	**100%**	**3**	**6**	**4**	**6**
WR 241	Passing		7	10	21		78%	71%	68%		0	1	1
	NonPassing		2	1	4		22%	7%	13%		0	0	0
	Audit			3	6			21%	19%			0	0
	Total		**9**	**14**	**31**		**100%**	**100%**	**100%**		**1**	**1**	**2**
WR 242	Passing		6	4	1		86%	57%	11%		0	0	0
	NonPassing		1	3	8		14%	43%	89%		0	0	0

Enrollment Count, % of Total Enrollments and FTE Reimbursable broken down by Year vs. Course and Status. The data is filtered on Division, ActivityCode, Grade, Program Areas, Term, CollegeNowStudent, Operational Areas, Graduated, TransferNoGrad, Cohort Category, CohortCode, CohortEntryAgeGroup, Gender, Location, Section, Subject, TimeDay, OnCampusHS_Student and Dual_EnhancedOptions_Students. The Division filter keeps ETS, Community Education, Events, Other College and UG. The ActivityCode filter keeps LDC, CTE Prep and PSR Writing/Reading. The Grade filter keeps 19 of 19 members. The Program Areas filter keeps Writing Gateway and Writing LDC. The Term filter keeps Fall, Spring, Summer and Winter. The CollegeNowStudent filter keeps Null and Y. The Operational Areas filter keeps Family Center and Other. The Graduated filter keeps Null, N and Y. The TransferNoGrad filter keeps Null, N and Y. The Cohort Category filter keeps Null, Full Time First Time, Full Time Transfer, Part Time First Time and Part Time Transfer. The CohortCode filter keeps 105 of 105 members. The CohortEntryAgeGroup filter keeps 12 of 12 members. The Gender filter keeps Null, , F, M and N. The Location filter keeps Null, Curry, Main and Online. The Section filter keeps 10,830 of 10,847 members. The Subject filter keeps 98 of 98 members. The TimeDay filter keeps Null, Day, Evening and Online. The OnCampusHS_Student filter keeps N and Y. The Dual_EnhancedOptions_Students filter keeps N. The view is filtered on Year, Course and Status. The Year filter keeps 2013, 2014, 2015 and 2016. The Course filter keeps 1,386 of 1,397 members. The Status filter keeps Null, Audit, Non Graded, NonPassing and Passing.

Course Listing Passing Status

Course	Status	Enrollment Count				% of Total Enrollments				FTE Reimbursable			
		2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
WR 242	**Total**		**7**	**7**	**9**		**100%**	**100%**	**100%**		**0**	**0**	**1**
WR 243	Passing		6	4			75%	44%			0	0	
	NonPassing		2	5			25%	56%			0	0	
	Total		**8**	**9**			**100%**	**100%**			**1**	**1**	
WR 250	Passing	5	2	1	3	10%	6%	3%	5%	0	0	0	0
	NonPassing	19	15	24	1	40%	45%	65%	2%	1	1	2	0
	Audit	24	16	12	52	50%	48%	32%	93%	2	1	1	3
	Total	**48**	**33**	**37**	**56**	**100%**	**100%**	**100%**	**100%**	**3**	**2**	**2**	**4**
WR 298	Passing		1				100%				0		
	Total		**1**				**100%**				**0**		
Grand Total		**1,419**	**1,325**	**1,315**	**1,484**	**100%**	**100%**	**100%**	**100%**	**91**	**85**	**84**	**95**

Enrollment Count, % of Total Enrollments and FTE Reimbursable broken down by Year vs. Course and Status. The data is filtered on Division, ActivityCode, Grade, Program Areas, Term, CollegeNowStudent, Operational Areas, Graduated, TransferNoGrad, Cohort Category, CohortCode, CohortEntryAgeGroup, Gender, Location, Section, Subject, TimeDay, OnCampusHS_Student and Dual_EnhancedOptions_Students. The Division filter keeps ETS, Community Education, Events, Other College and UG. The ActivityCode filter keeps LDC, CTE Prep and PSR Writing/Reading. The Grade filter keeps 19 of 19 members. The Program Areas filter keeps Writing Gateway and Writing LDC. The Term filter keeps Fall, Spring, Summer and Winter. The CollegeNowStudent filter keeps Null and Y. The Operational Areas filter keeps Family Center and Other. The Graduated filter keeps Null, N and Y. The TransferNoGrad filter keeps Null, N and Y. The Cohort Category filter keeps Null, Full Time First Time, Full Time Transfer, Part Time First Time and Part Time Transfer. The CohortCode filter keeps 105 of 105 members. The CohortEntryAgeGroup filter keeps 12 of 12 members. The Gender filter keeps Null, , F, M and N. The Location filter keeps Null, Curry, Main and Online. The Section filter keeps 10,830 of 10,847 members. The Subject filter keeps 98 of 98 members. The TimeDay filter keeps Null, Day, Evening and Online. The OnCampusHS_Student filter keeps N and Y. The Dual_EnhancedOptions_Students filter keeps N. The view is filtered on Year, Course and Status. The Year filter keeps 2013, 2014, 2015 and 2016. The Course filter keeps 1,386 of 1,397 members. The Status filter keeps Null, Audit, Non Graded, NonPassing and Passing.

Course Listing Passing Status

Course	Status	Enrollment Count				% of Total Enrollments				FTE Reimbursable			
		2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
WR 80	Passing		1.0	34.0	14.0		25%	60%	52%		0.1	2.0	0.7
	NonPassing		3.0	23.0	13.0		75%	40%	48%		0.2	1.6	0.8
	Total		**4.0**	**57.0**	**27.0**		**100%**	**100%**	**100%**		**0.3**	**3.6**	**1.4**
WR 90	Passing	177.0	149.0	133.0	56.0	62%	65%	67%	77%	11.0	9.1	8.5	3.5
	NonPassing	108.0	79.0	67.0	17.0	38%	34%	34%	23%	6.9	4.9	4.1	1.0
	Audit		1.0				0%				0.1		
	Total	**285.0**	**229.0**	**200.0**	**73.0**	**100%**	**100%**	**100%**	**100%**	**17.9**	**14.1**	**12.7**	**4.5**
WR 90R	Passing				25.0				74%				1.7
	NonPassing				9.0				26%				0.7
	Total				**34.0**				**100%**				**2.5**
WR 95	Passing				9.0				53%				0.3
	NonPassing				8.0				47%				0.3
	Total				**17.0**				**100%**				**0.6**
WR 0525	Passing	3.0				50%				0.3			

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Course Listing Passing Status

Course	Status	Enrollment Count				% of Total Enrollments				FTE Reimbursable			
		2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
WR 0525	NonPassing	3.0				50%				0.2			
	Total	**6.0**				**100%**				**0.5**			
Grand Total		**291.0**	**233.0**	**257.0**	**151.0**	**100%**	**100%**	**100%**	**100%**	**18.4**	**14.4**	**16.2**	**9.1**

Enrollment Count, % of Total Enrollments and FTE Reimbursable broken down by Year vs. Course and Status. The data is filtered on Division, ActivityCode, Grade, Program Areas, Term, CollegeNowStudent, Operational Areas, Graduated, TransferNoGrad, Cohort Category, CohortCode, CohortEntryAgeGroup, Gender, Location, Section, Subject, TimeDay, OnCampusHS_Student and Dual_EnhancedOptions_Students. The Division filter keeps ETS, Community Education, Events, Other College and UG. The ActivityCode filter keeps LDC, CTE Prep and PSR Writing/Reading. The Grade filter keeps 19 of 19 members. The Program Areas filter keeps Writing PSR - Developmental. The Term filter keeps Fall, Spring, Summer and Winter. The CollegeNowStudent filter keeps Null and Y. The Operational Areas filter keeps Family Center and Other. The Graduated filter keeps Null, N and Y. The TransferNoGrad filter keeps Null, N and Y. The Cohort Category filter keeps Null, Full Time First Time, Full Time Transfer, Part Time First Time and Part Time Transfer. The CohortCode filter keeps 105 of 105 members. The CohortEntryAgeGroup filter keeps 12 of 12 members. The Gender filter keeps Null, , F, M and N. The Location filter keeps Null, Curry, Main and Online. The Section filter keeps 10,830 of 10,847 members. The Subject filter keeps 98 of 98 members. The TimeDay filter keeps Null, Day, Evening and Online. The OnCampusHS_Student filter keeps N and Y. The Dual_EnhancedOptions_Students filter keeps N. The view is filtered on Year, Course and Status. The Year filter keeps 2013, 2014, 2015 and 2016. The Course filter keeps 1,386 of 1,397 members. The Status filter keeps Null, Audit, Non Graded, NonPassing and Passing.

Course Listing Passing Status

Course	Status	Enrollment Count				% of Total Enrollments				FTE Reimbursable			
		2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
ENG 104	Passing	51.0	55.0	52.0	35.0	75%	77%	84%	61%	3.1	3.3	3.4	2.3
	NonPassing	16.0	16.0	10.0	22.0	24%	23%	16%	39%	1.0	0.8	0.6	1.4
	Audit	1.0				1%				0.1			
	Total	**68.0**	**71.0**	**62.0**	**57.0**	**100%**	**100%**	**100%**	**100%**	**4.2**	**4.1**	**4.0**	**3.7**
ENG 105	Passing	7.0	8.0	13.0	5.0	100%	80%	87%	83%	0.5	0.5	0.8	0.3
	NonPassing		2.0	2.0	1.0		20%	13%	17%		0.1	0.1	0.1
	Total	**7.0**	**10.0**	**15.0**	**6.0**	**100%**	**100%**	**100%**	**100%**	**0.5**	**0.6**	**0.8**	**0.4**
ENG 106	Passing	15.0	6.0	4.0		88%	86%	44%		1.0	0.4	0.3	
	NonPassing	2.0	1.0	5.0		12%	14%	56%		0.1	0.1	0.3	
	Total	**17.0**	**7.0**	**9.0**		**100%**	**100%**	**100%**		**1.1**	**0.5**	**0.5**	
ENG 107	Passing	11.0	12.0	5.0	7.0	79%	80%	63%	58%	0.7	0.8	0.3	0.5
	NonPassing	3.0	3.0	3.0	5.0	21%	20%	38%	42%	0.1	0.2	0.1	0.3
	Total	**14.0**	**15.0**	**8.0**	**12.0**	**100%**	**100%**	**100%**	**100%**	**0.8**	**1.0**	**0.4**	**0.8**
ENG 108	Passing	17.0	14.0	12.0	6.0	85%	93%	71%	86%	1.1	0.9	0.8	0.3

Enrollment Count, % of Total Enrollments and FTE Reimbursable broken down by Year vs. Course and Status. The data is filtered on Division, ActivityCode, Grade, Program Areas, Term, CollegeNowStudent, Operational Areas, Graduated, TransferNoGrad, Cohort Category, CohortCode, CohortEntryAgeGroup, Gender, Location, Section, Subject, TimeDay, OnCampusHS_Student and Dual_EnhancedOptions_Students. The Division filter keeps ETS, Community Education, Events, Other College and UG. The ActivityCode filter keeps LDC and CTE Prep. The Grade filter keeps 19 of 19 members. The Program Areas filter keeps Philosophy - Literature - Humanities Programs. The Term filter keeps Fall, Spring, Summer and Winter. The CollegeNowStudent filter keeps Null and Y. The Operational Areas filter keeps Family Center and Other. The Graduated filter keeps Null, N and Y. The TransferNoGrad filter keeps Null, N and Y. The Cohort Category filter keeps Null, Full Time First Time, Full Time Transfer, Part Time First Time and Part Time Transfer. The CohortCode filter keeps 105 of 105 members. The CohortEntryAgeGroup filter keeps 12 of 12 members. The Gender filter keeps Null, , F, M and N. The Location filter keeps Null, Curry, Main and Online. The Section filter keeps 10,830 of 10,847 members. The Subject filter keeps 98 of 98 members. The TimeDay filter keeps Null, Day, Evening and Online. The OnCampusHS_Student filter keeps N and Y. The Dual_EnhancedOptions_Students filter keeps N. The view is filtered on Year, Course and Status. The Year filter keeps 2013, 2014, 2015 and 2016. The Course filter keeps 1,386 of 1,397 members. The Status filter keeps Null, Audit, Non Graded, NonPassing and Passing.

Course Listing Passing Status

Course	Status	Enrollment Count				% of Total Enrollments				FTE Reimbursable			
		2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
ENG 108	NonPassing	3.0	1.0	5.0	1.0	15%	7%	29%	14%	0.2	0.1	0.3	0.1
	Total	**20.0**	**15.0**	**17.0**	**7.0**	**100%**	**100%**	**100%**	**100%**	**1.3**	**1.0**	**1.0**	**0.4**
ENG 109	Passing	16.0	9.0	16.0	11.0	84%	90%	73%	58%	1.0	0.6	1.0	0.7
	NonPassing	3.0	1.0	6.0	7.0	16%	10%	27%	37%	0.2	0.1	0.4	0.4
	Audit				1.0				5%				0.1
	Total	**19.0**	**10.0**	**22.0**	**19.0**	**100%**	**100%**	**100%**	**100%**	**1.2**	**0.6**	**1.4**	**1.2**
ENG 204	Passing	3.0			2.0	75%			40%	0.1			0.1
	NonPassing	1.0			3.0	25%			60%	0.0			0.2
	Total	**4.0**			**5.0**	**100%**			**100%**	**0.1**			**0.3**
ENG 206	Passing		1.0		7.0		25%		78%		0.1		0.5
	NonPassing		3.0		2.0		75%		22%		0.2		0.1
	Total		**4.0**		**9.0**		**100%**		**100%**		**0.3**		**0.6**
ENG 262	Passing	11.0	11.0	3.0		79%	92%	50%		0.7	0.7	0.2	
	NonPassing	3.0	1.0	3.0		21%	8%	50%		0.2	0.1	0.2	

Enrollment Count, % of Total Enrollments and FTE Reimbursable broken down by Year vs. Course and Status. The data is filtered on Division, ActivityCode, Grade, Program Areas, Term, CollegeNowStudent, Operational Areas, Graduated, TransferNoGrad, Cohort Category, CohortCode, CohortEntryAgeGroup, Gender, Location, Section, Subject, TimeDay, OnCampusHS_Student and Dual_EnhancedOptions_Students. The Division filter keeps ETS, Community Education, Events, Other College and UG. The ActivityCode filter keeps LDC and CTE Prep. The Grade filter keeps 19 of 19 members. The Program Areas filter keeps Philosophy - Literature - Humanities Programs. The Term filter keeps Fall, Spring, Summer and Winter. The CollegeNowStudent filter keeps Null and Y. The Operational Areas filter keeps Family Center and Other. The Graduated filter keeps Null, N and Y. The TransferNoGrad filter keeps Null, N and Y. The Cohort Category filter keeps Null, Full Time First Time, Full Time Transfer, Part Time First Time and Part Time Transfer. The CohortCode filter keeps 105 of 105 members. The CohortEntryAgeGroup filter keeps 12 of 12 members. The Gender filter keeps Null, , F, M and N. The Location filter keeps Null, Curry, Main and Online. The Section filter keeps 10,830 of 10,847 members. The Subject filter keeps 98 of 98 members. The TimeDay filter keeps Null, Day, Evening and Online. The OnCampusHS_Student filter keeps N and Y. The Dual_EnhancedOptions_Students filter keeps N. The view is filtered on Year, Course and Status. The Year filter keeps 2013, 2014, 2015 and 2016. The Course filter keeps 1,386 of 1,397 members. The Status filter keeps Null, Audit, Non Graded, NonPassing and Passing.

Course Listing Passing Status

		Enrollment Count				% of Total Enrollments				FTE Reimbursable			
Course	Status	2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
ENG 262	**Total**	**14.0**	**12.0**	**6.0**		**100%**	**100%**	**100%**		**0.9**	**0.8**	**0.4**	
HUM 204	Passing	99.0	88.0	139.0	63.0	80%	75%	87%	72%	6.6	5.7	9.2	4.0
	NonPassing	25.0	29.0	21.0	25.0	20%	25%	13%	28%	1.5	1.7	1.3	1.7
	Total	**124.0**	**117.0**	**160.0**	**88.0**	**100%**	**100%**	**100%**	**100%**	**8.0**	**7.4**	**10.4**	**5.7**
HUM 205	Passing	56.0	73.0	72.0	61.0	86%	88%	81%	78%	3.6	4.7	4.5	3.8
	NonPassing	9.0	10.0	17.0	17.0	14%	12%	19%	22%	0.6	0.5	1.0	1.0
	Total	**65.0**	**83.0**	**89.0**	**78.0**	**100%**	**100%**	**100%**	**100%**	**4.2**	**5.2**	**5.5**	**4.9**
HUM 206	Passing	55.0	64.0	68.0	21.0	79%	79%	78%	72%	3.6	4.2	4.4	1.4
	NonPassing	15.0	17.0	19.0	8.0	21%	21%	22%	28%	0.9	1.1	1.1	0.5
	Total	**70.0**	**81.0**	**87.0**	**29.0**	**100%**	**100%**	**100%**	**100%**	**4.5**	**5.3**	**5.5**	**1.9**
PHL 101	Passing	64.0	41.0	55.0	39.0	93%	85%	98%	75%	4.4	2.7	3.7	2.7
	NonPassing	5.0	7.0	1.0	13.0	7%	15%	2%	25%	0.3	0.4	0.1	0.8
	Total	**69.0**	**48.0**	**56.0**	**52.0**	**100%**	**100%**	**100%**	**100%**	**4.7**	**3.0**	**3.8**	**3.5**
PHL 102	Passing	155.0	163.0	162.0	153.0	94%	96%	94%	89%	9.8	10.3	10.4	10.0

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Course Listing Passing Status

Course	Status	Enrollment Count				% of Total Enrollments				FTE Reimbursable			
		2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
PHL 102	NonPassing	10.0	7.0	11.0	19.0	6%	4%	6%	11%	0.6	0.4	0.7	1.2
	Total	**165.0**	**170.0**	**173.0**	**172.0**	**100%**	**100%**	**100%**	**100%**	**10.4**	**10.7**	**11.0**	**11.2**
PHL 103	Passing	128.0	104.0	85.0	101.0	95%	87%	89%	85%	7.9	6.5	5.3	6.4
	NonPassing	7.0	15.0	11.0	18.0	5%	13%	11%	15%	0.3	0.9	0.5	1.2
	Total	**135.0**	**119.0**	**96.0**	**119.0**	**100%**	**100%**	**100%**	**100%**	**8.1**	**7.3**	**5.8**	**7.6**
Grand Total		**791.0**	**762.0**	**800.0**	**653.0**	**100%**	**100%**	**100%**	**100%**	**50.2**	**47.7**	**50.7**	**42.0**

Enrollment Count, % of Total Enrollments and FTE Reimbursable broken down by Year vs. Course and Status. The data is filtered on Division, ActivityCode, Grade, Program Areas, Term, CollegeNowStudent, Operational Areas, Graduated, TransferNoGrad, Cohort Category, CohortCode, CohortEntryAgeGroup, Gender, Location, Section, Subject, TimeDay, OnCampusHS_Student and Dual_EnhancedOptions_Students. The Division filter keeps ETS, Community Education, Events, Other College and UG. The ActivityCode filter keeps LDC and CTE Prep. The Grade filter keeps 19 of 19 members. The Program Areas filter keeps Philosophy - Literature - Humanities Programs. The Term filter keeps Fall, Spring, Summer and Winter. The CollegeNowStudent filter keeps Null and Y. The Operational Areas filter keeps Family Center and Other. The Graduated filter keeps Null, N and Y. The TransferNoGrad filter keeps Null, N and Y. The Cohort Category filter keeps Null, Full Time First Time, Full Time Transfer, Part Time First Time and Part Time Transfer. The CohortCode filter keeps 105 of 105 members. The CohortEntryAgeGroup filter keeps 12 of 12 members. The Gender filter keeps Null, , F, M and N. The Location filter keeps Null, Curry, Main and Online. The Section filter keeps 10,830 of 10,847 members. The Subject filter keeps 98 of 98 members. The TimeDay filter keeps Null, Day, Evening and Online. The OnCampusHS_Student filter keeps N and Y. The Dual_EnhancedOptions_Students filter keeps N. The view is filtered on Year, Course and Status. The Year filter keeps 2013, 2014, 2015 and 2016. The Course filter keeps 1,386 of 1,397 members. The Status filter keeps Null, Audit, Non Graded, NonPassing and Passing.

II. Financial Viability

Exhibit II.A: Student FTE
~~FTE rose from the 2009 level by about 10% in 2010 and remained slightly higher in 2011, but has since returned to the 2009 level.~~ [Data not available for current cycle.]
Exhibit II.B: Billing Credits
~~Billing credits have dropped steadily from 6719 in 2009 to 4799 in 2013.~~ [Data not available for current cycle.]
Exhibit II.C:

- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps*
  The writing program remains stable. A number of credits are being taught at the high schools through the dual credit program; this may impact the college.

- **Plan:** *Respond to the data evidence – how will the data results be utilized to enhance and improve graduate student success within the program, list specific planned projects*
  Costs appear to be rising slightly. There are no planned projects related to financial viability.

III. Efficiency of Delivery

Average Class Enrollments
Class enrollment size remains under 20 for writing courses and is around 17 for PSRs.
Student FTE to Faculty FTE Ratio (1 Faculty FTE = 45 Workload Credits) [Data not available for current cycle.]
Course Capacity Percentage (section enrollment is what percent of section capacity) Fill rate has remained between 69% and 70%.

- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps*
  Enrollments in particular classes have not changed greatly.
- **Plan:** *Respond to the data evidence – how will the data results be utilized to enhance and improve graduate student success within the program, list specific planned projects*
  Because student/faculty FTE has risen slightly, we assume faculty are being used effectively. No planned projects.

IV. Instructional Effectiveness

Exhibit IV.A: Course Retention – completion rate

- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps*
  Course retention is basically unchanged, ranging from 68% to 71%.

- **Plan:** *Respond to the data evidence – how will the data results be utilized to enhance and improve graduate student success within the program, list specific planned projects*
  Course retention is good and at stable levels. Projects include researching effectiveness of course scheduling, pre- and post-testing of student writing ability, and support and review of part-time faculty.

V. Program Student Success

~~Exhibit V.A:~~ ~~Program Persistence from Persistence Report~~ (being developed)
Exhibit V.B: Program Completers (Graduated) **(unduplicated student count)** N/A
Exhibit V.C: Program Awards **(all certificates and degree, duplicated)** N/A
~~Exhibit V.D:~~ ~~Transfer Rate (student who did not graduate yet transferred) from Transfer Report~~ (being developed)
~~Exhibit V.E:~~ ~~Transfer Figures from Transfer Report~~ (being developed)

- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps*
  N/A
- **Plan:** *Respond to the data evidence – how will the data results be utilized to enhance and improve graduate student success within the program, list specific planned projects*
  N/A

VI. Program Relevance

Exhibit II.A: OLMIS Reports Demonstrate Employment Opportunities - ***OLMIS DATA:*** https://www.qualityinfo.org/
Exhibit II.B: Advisory Committee Recommendations

- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps*

- **Plan:** *Respond to the data evidence – how will the data results be utilized to enhance and improve graduate student success within the program, list specific planned projects*

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VII. Graduate Student Success: Oregon 4 Year Completion Data, Wage Match Data, Placement

Exhibit VI.A: 4 Year Achievement (if available)

This data is unavailable, but the MSC predicts that our students are graduating from SWOCC at a sophomore writing ability and are on tract 4 year universities.

Exhibit VI.B: Wage Information (if available)

Exhibit VI.C: Placement Rates (if available)

- **Analysis:** *Reflect upon the trends, what does the data tell you, what has been accomplished/achieved and where are the gaps*
  The Writing Program prepares students well for transfer to university. Most students complete their writing courses before transfer.
- **Plan:** *Respond to the data evidence – how will the data results be utilized to enhance and improve graduate student success within the program, list specific planned projects*
  4-year achievement levels are good; no projects planned.

PART D: Systemic Program Projects

Systemic Program Enhancements and Projects Not Addressed in Program Outcomes or Operational Data Analysis Data

- **Address systemic issues**:

- **Proposed Systemic Project(s)**:

Systemic Program Enhancements and Projects Not Addressed in Program Outcomes or Operational Data Analysis Data

- **Program Demand:** Review of overall 4-year trend of enrollments in discipline courses @ -8%
  >10 Growing Strong (20 pt.)
  5-10% Growing (17 pt.)
  0-5% Maintaining (14 pt.)
  5-0% Dropping (10 pt.)
  <-5% (5 pt.)
- **Program Outcomes Assessment:**

Assessment Category **READING PROGRAM**	**No Evidence (1 pt.)**	**In Development <30% (2 pt.)**	**Implemented in Some Areas 30-80% (3 pt.)**	**Fully Implemented 81-100% (4 pt.)**	**TOTAL SCORE**
Development of course outcomes				**x**	**4**
Mapping course to program outcomes				**x**	**4**
Multiple Assessment measures documented and mapped to program outcomes				**x**	**4**
Course Assessment data collected and analyzed			**x**		**3**
Assessment Data used to improve course teaching / learning and is documented			**x**		**3**
Total					**18 pt.**

- **Program Size: Review of unduplicated student FTE (all terms) in discipline courses in prior year@ 141 FTE**

>50 FTE (20 pt.)
30-50 FTE (17 pt.)
20-30 FTE (14 pt.)
15-20 FTE (10 pt.)
10-14 FTE (7 pt.)
<10 FTE (5 pt.)

- **Proposed Productivity:** Percent of students in all discipline classes for a year that earned C or better compared to number of students enrolled in same classes at end of second week @ 71%

>95% (20 pt.)
90-95% Growing (18 pt.)
80-90% Maintaining (16 pt.)
70-80 % Dropping (14 pt.)
60-70% (10 pt.)
<10% (5 pt.)

- **Program Cost:** Cost of program per student FTE in prior year @ $2801.67

< $1000/FTE (20 pt.)
$1-2000/FTE (17 pt)
$2-3000/FTE (14 pt.)
$3-4000/FTE (10 pt)
$>4000/FTE (5 pt.)

- **OVERALL PROGRAM VIABILITY SCORE:** 71 pt

PART E: Program Project Timeline – All Projects

Activity Timeline that includes core theme association, staff lead responsibility, start and projected end dates, association with other planning activities (academic master plan, technology plan, facilities plan), association with instructional projects.

Project	Person Responsible	Activity Year	Budget Request (for 2015 activities only)	Core Theme/ Objective	Associated Plans	Associated Projects
1. Update program outcomes and assessment mapping.	Writing Department	Ongoing	$0.00	Learning and Achievement	See AMP	
2. Develop part-time faculty coordination plan to include ongoing instruction evaluation, curriculum review, and professional development opportunities	Rod Keller	Ongoing	$0.00	Learning and Achievement	See AMP	
3. Reviewing course enrollment to determine effectiveness of offerings and scheduling	Writing Department	Ongoing	$0.00	Learning and Achievement	See AMP	
4. Ongoing outcomes assessment to evaluate effectiveness of writing program	Writing Department	Ongoing	$0.00	Learning and Achievement	See AMP	
5. Evaluate placement procedures; implement if warranted	Writing Department	Ongoing	$0.00	Learning and Achievement	See AMP	
6. Restructuring and revitalizing the Writing Center	Writing Department	Ongoing	$0.00	Learning and Achievement	See AMP	