This guide will show Assessment Coordinators, Faculty, Chairs and Deans the process of program assessment for 2020-2021, including descriptions, examples and rubric measures for the annual program assessment report. Follow the guide description text in black while referencing the example text in blue and the rubric text in gray. This guide has changes to move our institution into alignment with the new NWCCU standards.

Academic Assessment: Three Year Cycle

ISLO/ESLO Three Year Academic Assessment Cycle (Student Success)		
Year 1 ISLO/ESLO's 2020-2021	Year 2 ISLO/ESLO's 2021-2022	Year 3 ISLO/ESLO's 2022-2023
Plan **Communication, Teamwork, Ethical Reasoning** Upcoming assignments & assessments; Reflect and Evaluate	**Plan** **Diverse Perspectives including Cultural Sensitivity & Global Awareness** Upcoming assignments & assessments; Reflect and Evaluate	**Plan** **Inquiry & Analysis includes problem solving & Info literacy, critical analysis & logical thinking** **Quantitative Literacy & Reasoning** Upcoming assignments & assessments; Reflect and Evaluate
PLAN: Course Selections. Assignment Design, Rubric Design. (Program Planning report due start of winter quarter, feedback given by spring term).		
Assess **Inquiry & Analysis includes problem solving & Info literacy, critical analysis & logical thinking** **Quantitative Literacy & Reasoning** **Collect** Academic Assessment (FALL & WINTER) **Analyze** (SPRING)	**Assess** **Communication, Teamwork, Ethical Reasoning** **Collect** Academic Assessment (FALL & WINTER) **Analyze** (SPRING)	**Assess** **Diverse Perspectives including Cultural Sensitivity & Global Awareness** **Collect** Academic Assessment (FALL & WINTER) **Analyze** (SPRING)
ASSESS: Direct Measures- (circle) Faculty Grades (Rubric), Standardized Tests, Exams, Pre and Post Test Designs, Competency-Based Demonstrations, Portfolios Indirect Measures- (circle) Faculty Grades-DFW, Surveys & Reflections, Course Evaluations, Graduation Rates, Retention Rates. Program Collect and Analyze Report due at the end of spring term and feedback given by fall term.		
Act **Diverse Perspectives including Cultural Sensitivity & Global Awareness** Close loops, make improvements and remeasure Engage campus (professional development)	**Act** **Inquiry & Analysis includes problem solving & Info literacy, critical analysis & logical thinking** **Quantitative Literacy & Reasoning** Close loops, make improvements and remeasure Engage campus (professional development)	**Act** **Communication, Teamwork, Ethical Reasoning** Close loops, make improvements and remeasure Engage campus (professional development)

Figure 1: Oregon Tech ISLO/ESLO Three Year Cycle of Academic Assessment

2020-2021 Plan, Assess and Act

2020-2021	ISLO/ESLO	Assessment Activities	Due Dates
PLAN A year of planning Reflect Evaluate	Communication Teamwork Ethical Reasoning	• Attend assessment days professional development and assignment design workshops. • Collaborate with your Program Faculty, Department Faculty, Chairs, and Deans on the planning of your assessments for next year. • Submit your communication, teamwork and ethical reasoning assessment plan on October 31st, 2021 and begin implementing fall 2021.	Planning Report Due with your Assessment Report October 31st, 2021 Include Assignments and Rubrics
ASSESS A year of assessing and analyzing Collect Analyze	Inquiry and Analysis (problem solving, critical, analysis and logical thinking) Quantitative Literacy (Quantitative Reasoning)	• Email Barb Meng- the courses you are assessing during Convocation 2020 • Collect Fall and Winter Quarter • Analyze in the Spring • 2 direct measures and at least 1 indirect measure	Assessment Report Due with your Assessment Report October 31st, 2021 Include Assignments and Rubrics
ACT A year of action Engage	Diverse Perspectives	Take an action in your program to improve student success related to Diverse Perspectives Take an action in your program to improve student success related to curricular improvements, graduation rates, retention and DFWI rates. Close loops Engage the campus in professional development	Assessment Report Due with your Assessment Report October 31st, 2021 Include Evidence of completed improvements in student success in your program

Figure 2: 2020-2021 Plan, Assess and Act

Direct and Indirect Measures of Student Learning

Direct Measures
• Faculty Grades – rubric oriented
• Standardized tests, exams
• Pre- and Post-Test Designs
• Competency-based demonstration
• Portfolios

Indirect Measures
• Faculty Grades – DFW, for example
• Surveys and Reflections
• Course evaluations
• Graduation Rates
• Retention Rates

Figure #3: NWCCU Direct and Indirect Measures

Planning Section
Additional Instructions

Planning at Convocation 2020

a. Put Program Learning Outcomes on a 3-year cycle
b. Create a Learning Outcomes Alignment Map to identify the courses that support this year's program learning outcomes and institutional learning outcomes (figure 4 below).
c. Include all Learning Outcomes on a Syllabi
d. Pick your courses, assignments and rubrics for Inquiry & Analysis plus Quantitative Reasoning. Email those choices to Barb Meng by the end of convocation week and begin collection.
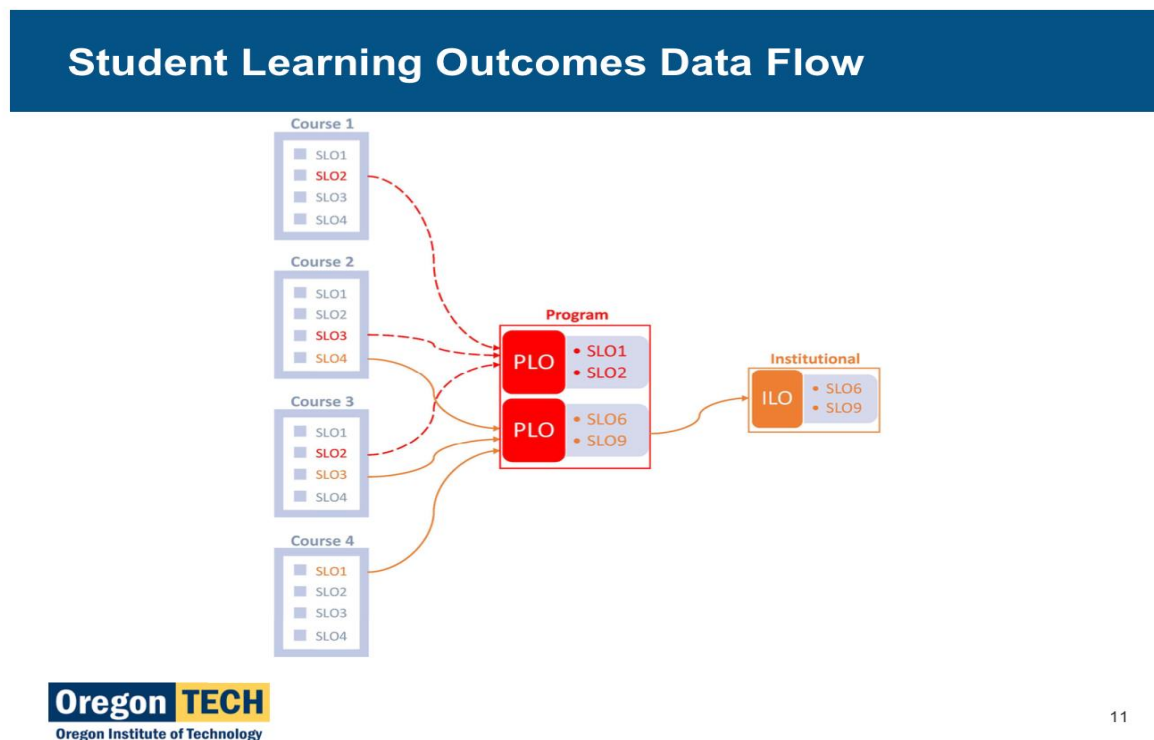

Figure 4: CLO alignment map to PLOs and ISLO/ESLO's

Winter Term

a. Submit your PLOs to your Dept. Chair to be make the deadline for the catalog so they appear in the catalog next year.

Planning Every Quarter

a. Fill out course worksheet at the end of the term when you submit grades for only those courses that align in support of this year's PLOs and ISLO/ESLO (see figure 5).
b. Course Learning Outcomes are published on every syllabus.

Tech Web Learning Outcomes Course Worksheet

Completed every quarter on any class that supports a PSLO and ISLO/ESLO
Figure #5: Tech Web: Course Learning Worksheet (only on courses that support PLOs and ISLO/ESLOs for this year.

Example

Upon completion of this course, the student will be able to:

1) Identify ethical and non-ethical choices used in…

2) Apply ethical reasoning when constructing arguments for…

3) Construct arguments using ethical principles to…

GRADING

Grading information is required on all student learning outcomes covered in the course. This includes detailed information about how student performance is evaluated.

Example:

STUDENT LEARNING OUTCOMES	Quizzes	Midterm Exam	Final Exam	OUTCOME ACHIEVED (YES=1, NO=0)
SLO 1	10%	70%		1
SLO 2		76%	70%	1
SLO 3	80%		69%	1
SLO 4	68%		65%	0
SLO 5		70	80%	1
STANDARD	70%	70%	70%	

INSTRUCTOR'S COMMENTS:

1. **Student Learning Outcomes.** Students achieved all SLOs except SLO 4. Additional practice is expected to improve their score.

2. **Student Success Gaps.** What is your DFWI rate for this course this quarter for this class? _____

   a. If over 20%, what is your plan to improve (Strategies) the DFWI rate of this course.

   b. If it is over 20%, please break it down across gender, racial groups, first generation students, and socio-economic status.

   c. Is there an equity gap?

      ☐ No

      ☐ Yes. If yes, how to plan to close the equity gap (strategies) in this course?
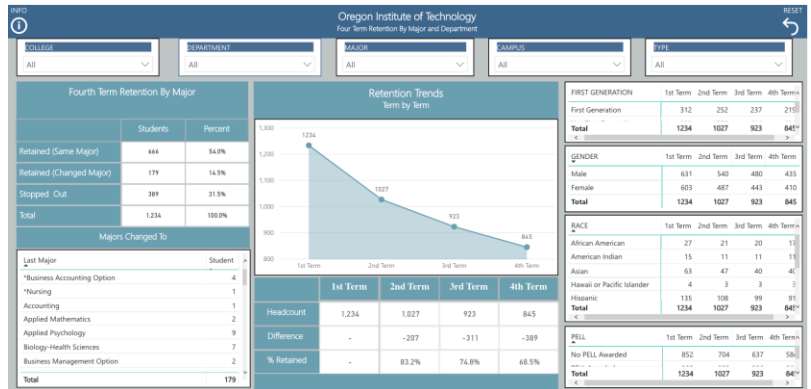
Equity Gap Dashboards

https://www.oit.edu/faculty-staff/institutional-research/dashboards

(Access restricted to chairs, deans and pilot programs only-will be opened to all faculty at Convocation 2020)
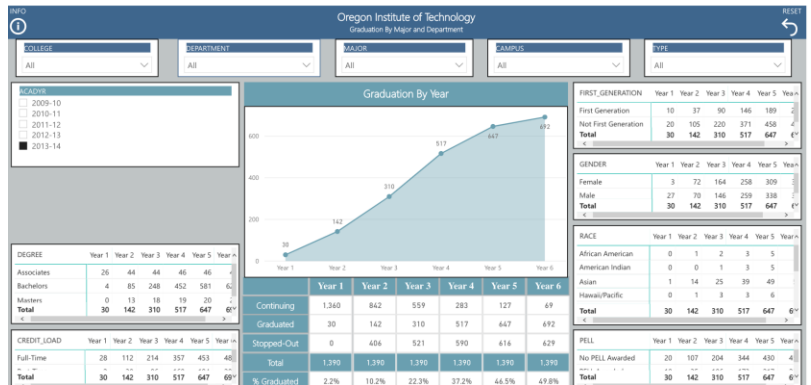
Retention
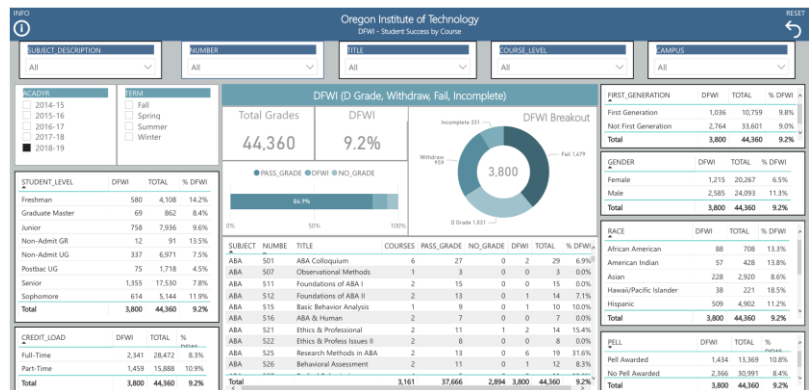Tracks retention of new degree seeking students over 4 terms (figure 6)

Graduation and Persistence
Tracks persistence and completion of new degree seeking students (figure 7)

DFWI (D Grade, Fail, Withdraw & Incomplete)
Provides DFWI rates by course (figure 8)

Equity Gap Dashboards Reflection Questions *(Due October 31st 2021)*

1. Retention Dashboard: What is the retention rate for all students in your program? How do retention rates compare across gender, racial groups, for first-generation students, and for low socio-economic students (Pell grant eligible)? What opportunities did the comparative data create for improvement? What actions do you plan to take to improve retention rates in your program this coming year?

2. Graduation Dashboard: What is the graduation rate for all students in your program? How do retention rates compare across gender, racial groups, for first-generation students, and for low socio-economic students (Pell grant eligible)? How do you plan to improve graduation rates in your program this coming year?

3. Student Success Dashboard: List courses with DFWI rates greater than 20% and include disaggregated data across gender, across all racial groups, for first-generation students, and for low socio-economic students (Pell Grant eligible)? What are the gatekeeper courses in your program? How do you plan to improve (strategies) the DFWI rates in courses in your program this coming quarter/year?

4. After looking at the disaggregated data from all three dashboards, list the top three equity gaps that the data show in your program and briefly discuss plans (strategies) to try to close them?

5. What feedback do you have for the Assessment Office to improve the dashboards and reflection questions? DFWI D = D Grade F = Fail W = Withdraw I = Incomplete

Continuous improvement evidence collection
Program Reflections Questions on your past year improvements

1. What changes and improvements overall did you make in your program last year and why?

2. What changes in budget or resource allocations did you make in your program last year and why (i.e. new faculty, new equipment, etc.)?

3. What curriculum changes did you do in your program this last year and why?

4. What improvements do you plan this next year that will impact job success, curriculum improvements, even better alignment with industry needs and resource allocations? What data do you need to collect this next year to help support the improvements you want for your program?

5. What are your greatest student success and achievement stories that you have had in the last year?

Academic Assessment

Section 1 – Program Mission and Educational Objectives

NWCCU's standards for accreditation require that institutions offer "programs with appropriate content and rigor that are consistent with its mission" (1.C.1.)

In this section, address the following:
- **Program Mission:** What is the purpose of the degree program? What professional and lifelong opportunities does it prepare students for? Where is it anticipated that graduates end up – both immediately after graduation and 5-10 years out?
- **Mission Alignment:** How is the program's mission aligned with the university mission to offer "innovative, professionally focused undergraduate and graduate degree programs," providing a "hands-on, project-based learning environment."

[Note: In the past, we have asked programs to articulate distinct mission and educational objectives. Programs are welcome to keep these, but we are no longer requiring each as a separate entity. Instead, we encourage you to focus your mission and objectives statement on the sorts of professional and life experiences that your degree program prepares students for.]

See also:
- Section 1 Rubric (below)

Section 2 – Program Description and History

This content will stay fairly static from year to year, and can be included in any reasonable order, but program enrollment, graduate, and employment, and (if applicable) board pass rates should be updated each year based on updated data.

In this section, provide an overview of your program, including information such as:

- Program History

- Program Locations

- Program Enrollment

- Program Graduates

- Employment Rates and Salaries

- Board and Licensure Exam Results (if applicable)

- Industry Relationships

- Showcase Significant Learning Experiences – Particularly those that align with Oregon Tech's mission to deliver a "Hands-On, project-based learning environment" and "innovative, professionally-focused programs"

- Success Stories – Descriptions of successful graduates (potentially including quotes from students highlight the programs' effective preparation)

- Program Changes – What recent changes have occurred within the program (e.g. new faculty, new facilities, curriculum changes)

Section 3 – Program Student Learning Outcomes

NWCCU's standards for accreditation require that programs must "culminate in achievement of clearly identified student learning outcomes." (1.C.1.)

In this section, address the following:
- **PSLOs:** What are the 5-10 program student learning outcomes – the key skills, supported and scaffolded across the program, which graduates will need to be able to demonstrate by graduation in order to successfully pursue the professional directions described the program's mission statement?
  - Resources on Bloom's Taxonomy: http://oregonstate.edu/instruct/coursedev/models/id/taxonomy/#table
  - Resources on program student learning outcomes:
    - https://manoa.hawaii.edu/assessment/howto/outcomes.htm
    - https://www.jmu.edu/assessment/_files/How%20to%20Write%20Clear%20Objectives.pdf
    - https://www.jmu.edu/assessment/_files/Objectives%20Made%20Easy.pdf

- **Origin and External Validation:** Content and learning outcomes need annual review by other content experts to stay current.

- **Changes:** Put Program Learning Outcomes on a three year cycle.

- **Clearly Written Language:** Make sure Program Learning Outcomes and course learning outcomes are written clearly so students know what skill they are trying to master.

- **Complete Tech Web Course Learning Outcomes Worksheet** *(see planning on page 4)*

Section 4 – Curriculum Map

NWCCU's standards for accreditation requires that programs must demonstrate "an appropriate breadth, depth, sequencing, and synthesis of learning" of student learning outcomes. (1.C.2)

- **Curriculum Map:** How are each of your program student learning outcomes (and institutional ESLO's) supported and scaffolded throughout the program's curriculum?

To address this, please complete a table with program's curriculum map, with identification of how each PSLO and ESLO appears within the curriculum at the Foundation (Introduction), Practice (Reinforcement and Application) and Capstone (Synthesis) levels.

Resources to Guide Creation of Curriculum Maps: https://manoa.hawaii.edu/assessment/howto/mapping.htm

This content should remain relatively static from year to year, but should be updated as the program curriculum map changes.

Section 5 – Assessment Cycle

In this section, please complete a table to show which courses (and, where known, what assignments) are used to assess each PSLO and ESLO in a three-year cycle. (Although some programs may have compelling reasons to adopt a different cycle, assessment of program learning outcomes should follow a three-year cycle, with the intention that improvements prompted by one year's assessment should be designed and implemented during the two years prior to the next scheduled assessment of that outcome.)

Each PSLO should be assessed with 2 direct measures and 1 indirect measure (the indirect measure is often the Student Exit Survey, which asks graduating students about each PSLO each year).

This content should remain relatively static from year to year, although it should be extended by at least one year (and the old year dropped off) each time a new report is submitted.

Section 6 – Assessment Activity

NWCCU's standards for accreditation require that institutions engage in "an effective system of assessment to evaluate the quality of learning in its programs" that "recognizes the central role of faculty in establishing quality, assessing student learning, and improving instructional programs." (1.C.5.)

In this section, address the following for each assessment activity conducted during the academic year covered by the report. This section may be integrated with Section 7 (Action Plans) and 8 (Re-assessment) as appropriate:

- **Activity**: What is the activity – (for a direct assessment, typically the course assignment) – used to assess this outcome? Describe in enough detail to make it clear how the activity is a reasonable measure of the outcome, and attach the assignment as an appendix. (Archiving the assignment is critical for consistent reassessment.)

- **Rubric**: How is the activity to be scored/evaluated? (Especially if scoring to assess the outcome is different from course grading). Describe in enough detail to makes it clear the rubric or scoring approach is a reasonable way to assess the outcome. Where a rubric is used, attach the rubric as an appendix. (Archiving the rubric is critical for consistent reassessment.)

- **Sample**: How many student artifacts were assessed? Was the population representative of the program as a whole? Were there any special or unusual characteristics of the student population that should be noted?

- **Reliability**: Who was involved in the scoring? How was consistency of rubric use assured? Have multiple faculty been involved in the scoring process to ensure reliability of the data? (Involving multiple raters for reliability is a best practice requested by NWCCU.)

- **Multiple Sites**: How is comparable assessment of this outcome carried out across all program sites? Although assessment processes do not need to be identical between different sites, the same measures should be assessed in comparable ways that facilitate exchange of ideas between program faculty at different sites.

- **Performance Target**: What was the target performance level? If less than 100%, why was the target performance level set at that point?

- **Performance Level**: What are the summary results? (i.e. What is the distribution of rubric scores?) What percentage of students exceeded the performance target?

- **History of Results**: Is there data from the previous assessment of this outcome, particularly if conducted with comparable methods? What trend(s) are seen in student performance over time?

- **Faculty Discussion:** How and when were results presented to and discussed by program faculty?

- **Interpretation**: What meaning or take-aways can be gleaned from this data? What are the factors, such as assignment design, course context, instructor, etc., that may have impacted student performance, either positively or negatively?

See also:
- Section 6 rubric (below)
- Section 6 template (below)
- B.S., Electronics Engineering Technology, 2017-2018;
- B.S., Applied Mathematics, 2017-2018

Section 7 – Data-driven Action Plans: Changes Resulting from Assessment

NWCCU's standards for accreditation require that institutions "uses the results of its assessment efforts to inform academic and learning support planning and practices." (1.C.7.)

Every program should, based on assessment data, identify at least one area to focus on for improvement stemming from assessment results. Performance is below target threshold should also trigger action.

In this section, address the following for each improvement activity sparked by assessment data:

- **Action Driver:** What assessment data prompted or supports action?

- **Action Specifics:** Is the needed action an improvement in instruction or in assessment? What improvement action is planned? How do you anticipate it will address the specific deficiencies found in assessment data?

- **Accountability:** What course, activities, or assignments will changes take place in? Who (specific names) will be responsible for implementation of these actions? When will these changes be implemented?

- **Planning and Budgeting:** What financial or resource needs will be require for implementation of these changes? How will they be sought or provided?

- **Improvements in Assessment Process:** What improvements are needed to the assessment process? How will they yield better, more actionable information?

- **Reassessment:** When will this outcome or measure be re-assessed, to determine if these changes have resulted in improved performance?

See also:
- Section 7 rubric (below)
- B.S., Applied Mathematics, 2016-2017 (page 6)

Section 8 – Closing the Loop: Evidence of Improvement in Student Learning

NWCCU's standards for accreditation require that institutions provide evidence of "continuous improvement of student learning." (1.C.7.)

If this is an outcome being assessed following improvement activity, did you have past results from this outcome? If this is a specifically scheduled "closing the loop" assessment, how do this year's results compare with the results that prompted improvements?

Did you have past action plans? Can you say that data supports that those plans resulted in improvements?

Look backwards: Discuss the last time that outcome was assessed.

- Were changes recommended?

- Were those changes implemented?

- If so, was improvement seen?

See also:
- Section 8 rubric (below)

EXAMPLE TEMPLATE, Section 2: (Format is not mandatory, but is meant for guidance. Choose the approach that works for your program).

Program History
The Vascular Technology Program officially began in 1992 and is one of the five current on-campus Medical Imaging programs at Oregon Institute of Technology. Enrollment trends from 2002 – 2016 have varied from 50 to 89 students per year in the program. By fall term of 2016, there were 50 students enrolled in the program. For the class of 2016, retention was 70.0% and attrition was 30%.

Program Location: Klamath Falls Campus only.

Program Enrollment:

Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	5 Year Difference	5 Year % Change
88	95	80	93	98	10	11.4%

Program Graduates:

2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
30	30	26	23	23	25	21	28	19	24

Employment Rates and Salaries:

Employed	Continuing Education	Looking for Work	Not Seeking	Median Salary	Success Rate
39	0	4	0	$62,000	91%

Board and Licensure Exam Results (if applicable):

American Registry of Diagnostic Medical Sonographers Vascular Technology	
100% Pass Rate	Class of 2016

EXAMPLE TEMPLATE, Section 4: (Format is not mandatory, but is meant for guidance. Choose the approach that works for your program).

Civil Engineering B.S. Student Learning Outcomes Table

F – Foundation
P – Practice
C – Capstone

COURSE	PSLO 1	PSLO 2	PSLO 3	ESLO 1 - Communication	ESLO 2 – Inquiry & Analysis	ESLO 3 – Ethical Reasoning	ESLO 4 – Quantitative Literacy	ESLO 5 - Teamwork	ESLO 6 – Diverse Perspectives
MATH 111	F								
WRI 121		F		F					
SPE 111			P	F					
ENGR 101				P					
CIV 100					P				

EXAMPLE TEMPLATE, Section 5: (Format is not mandatory, but is meant for guidance. Choose the approach that works for your program).

Civil Engineering B.S. Cycle for PSLOs and ESLOs

Outcome	2017-18	2018-19	2019-20
PSLO 1	Direct CIV 100 Direct CIV 105 Indirect Student Exit Survey		
PSLO 2		Direct CIV 100 Direct CIV 105 Indirect Student Exit Survey	
PSLO 3			Direct CIV 100 Direct CIV 105 Indirect Student Exit Survey
ESLO 1	Direct CIV 100 Direct CIV 105 Indirect Student Exit Survey		
ESLO 2		Direct CIV 100 Direct CIV 105 Indirect Student Exit Survey	
ESLO 3			
ESLO 4			
ESLO 5			
ESLO 6			

EXAMPLE TEMPLATE, Section 6: (Format is not mandatory, but is meant for guidance. Choose the approach that works for your program).

PSLO 1: Klamath Falls Campus, CIV 100, 201701, Seth Anthony

PSLO 1: An ability to apply knowledge of mathematics, science, and engineering.

Performance Criteria	Assessment Methods	Measurement Scale	Performance Target	Results
Demonstrates knowledge of the professional code of ethics.	Ethics assignment in CHE260 evaluated by course instructor using Oregon Tech's Ethics Rubric (attached as appendix A)	1-4 according to attached criteria	75% of students scoring 3 or higher	75% more than 3 75% = 4
Describes ethical issue using code of ethics	Ethics assignment evaluated by course instructor using Oregon Tech's Ethics Rubric.	1-4 according to attached criteria	75% of students scoring 3 or higher	100% more than 3 50% = 4

OREGON TECH PROGRAM ASSESSMENT REPORT RUBRIC (Section 1)			
1 – Beginning	**2 – Developing**	**3 – Good**	**4 – Exemplary**
Program Mission/Mission Alignment			
No mission statement or educational objectives are included.	Mission statement and objectives are vague, unclear, or lack coherence. They are too general too general to distinguish it from other programs or are focused on the department rather than the program.	Mission statements and objectives identify the programs purpose, but needs some development. The statement might not be focused on learners as the primary stakeholders.	Well-developed mission statements and objective outlines why the program exists and what distinguishes it from other units or programs. The wording of the statement is focused on learners as the primary stakeholders and is clear to a general audience.

OREGON TECH PROGRAM ASSESSMENT REPORT RUBRIC (Section 3)			
1 – Beginning	**2 – Developing**	**3 – Good**	**4 – Exemplary**
PSLOs			
No outcomes stated.	Outcomes present, but with non-measurable verbs (e.g., know, understand; things internal to the student), vague description of content/skill/or attitudinal domain, or outcomes aren't student-centered.	Outcomes generally contain precise and measurable verbs with rich description of the content/skill/or attitudinal domain. Outcomes describe how students demonstrate learning.	All outcomes are stated in student centered terms (i.e. "Students will…") with precise and measurable verbs (for example, from Bloom's taxonomy) articulating how students demonstrate learning, with rich description of the content/skill/or attitudinal domain.
Origin and External Validation			
No discussion of external validation of outcomes.	At a superficial level, it appears the learning outcomes are aligned with industry needs, but no explanation is provided.	General detail about how outcomes relate to industry needs or are externally validated is provided, but lacks detail or specificity. Little to no evidence of recent discussions (either internally or with external partners) about the currency of program learning outcomes.	External validation of outcomes is clearly articulated, through reference to outcomes originating from external accreditors, industry advisory boards, employer surveys, etc.. Evidence of recent program and external discussions about the continued relevance of learning outcomes.

OREGON TECH PROGRAM ASSESSMENT REPORT RUBRIC (Section 4)

1 – Beginning	2 – Developing	3 – Good	4 – Exemplary
Curriculum Map: Scaffolding			
No alignment of curriculum to outcomes.	Report contains a curriculum map connecting student experiences with some outcomes. Map is not clear or difficult to interpret.	Report contains a curriculum map clearly illustrating how each outcome is supported within the curriculum.	Report contains a curriculum map illustrating how the curriculum as a whole supports scaffolded, development (e.g., introduction, development, mastery) of each outcome for both program outcomes (PSLOs) and institutional outcomes (ESLOs).
Curriculum Map: Detail of Alignment			
Program doesn't demonstrate alignment of course activity with program learning outcomes.	Program asserts that course activity for at least some outcomes is at least somewhat aligned with program outcomes and points to some evidence to support this.	Program points to some level of detail about course activities (for instance, identifying an assignment by name) for each outcome that indicate meaningful and regular attention to program outcomes in course design.	Program points to publicly available materials (e.g. course syllabi, assignments, unit learning outcomes, class materials) which demonstrate thorough and consistent alignment in all course of relationships between course activity and program learning outcomes.

OREGON TECH PROGRAM ASSESSMENT REPORT RUBRIC (Section 5)			
1 – Beginning	**2 – Developing**	**3 – Good**	**4 – Exemplary**
Assessment Cycle: Current Year			
No activities/ courses listed for outcomes assessed during the current year	Activities/courses listed but link to outcomes is absent.	Most outcomes have classes and/or activities linked to them.	All outcomes assessed during the report year have classes (or activities) linked to them.
Assessment Cycle: 2 Direct, 1 Indirect			
No measures indicated	Most objectives are not assessed via direct measures (only with indirect measures).	Most objectives assessed with at least one direct measure and one indirect measure.	All objectives assessed using at least two direct measures (e.g., tests, essays) and one indirect measure.
Assessment Cycle: Multiple Years			
No formal assessment plan beyond current year.	Report contains a multi-year cycle outlining when assessment of all program student learning outcomes will occur.	Report contains a multi-year plan for assessment of learning outcomes, with courses identified for all assessment activities.	Clear, multi-year plan with several years of implementation (both past and future) outlined and clearly connected, with identification of courses (or activities where) assessment will occur. Plan extends out at least far as the next assessment of any outcomes assessed during the report year.

OREGON TECH PROGRAM ASSESSMENT REPORT RUBRIC (Section 6)			
1 – Beginning	**2 – Developing**	**3 – Good**	**4 – Exemplary**
Activity: Valid relationship between outcomes and assignment			
Seemingly no relationship between outcomes and assignment.	At a superficial level (e.g. based on the assignment title), it appears the assignment assessed by the measures matches the outcomes, but no explanation is provided.	General detail about how outcomes relate to assignment is provided. For example, the faculty wrote items to match the outcomes, or the assignment was selected "because its general description appeared to match our outcomes."	Narrative describes assignment and its alignment with outcomes, including providing the assignment in an appendix. Assignment appears to be a natural feature of the course and not inserted arbitrarily. Report describes assignment (including fit with class context) in sufficient detail to see that it is a natural feature of the course (not inserted arbitrarily) and is a reasonable way to assess that outcomes.
Rubric: Valid relationship between outcomes and rubric			
Seemingly no relationship between outcomes and rubric. (No indication of rubric being used.)	At a superficial level (such as based on a listing of rubric criteria), it appears that an appropriate rubric is used to assess the outcomes, but no explanation is provided.	Rubric and description report doesn't fully justify the appropriateness of the rubric to evaluation of the outcome; or rubric is missing detailed performance criteria (e.g. is just 1-4 ratings for each criteria). Rubric appears largely disconnected from student evaluation and feedback.	Rubric is provided and shows clear alignment between outcome and rubric criteria and elements. Detail provided regarding outcome-to-rubric alignment. Rubric or variant of rubric is used to provide feedback to students (isn't totally disjoint from class goals and feedback).
Sample: Data collection and research design			
No information is provided about data collection process or data not collected.	Limited information is provided about data collection such as how many students took the assessment, but not enough to judge the veracity of the process.	Enough information is provided to understand the data collection process, such as a description of the sample size, course conditions (student motivation to participate).	The data collection process is clearly explained (e.g. term, number of students), in sufficient detail to assure that student work reflects representative sampling and adequate student motivation.

Reliability			
No additional reliability information provided.	Report identifies process for scoring (e.g. identifies rater).	Multiple raters involved in scoring for at least some scores, or an externally validated rubric used. Reports states how efforts have been made to ensure reliability (e.g., raters were trained on rubric; reported scores are average from multiple raters).	Reliability (inter-rater comparisons) used for all scoring, with clear evidence of both internal agreements. Or, externally validated rubric used with trained scorers and inter-rater agreement. (Raw data provided in an appendix/attachment)
Multiple Sites			
No discussion of alignment of assessment processes across sites.	Report includes data from all sites where the program is offered.	Reports includes data from approximately comparable assessment activity for each outcome from all sites where the program is offered.	Similar measures are used at all multiple sites/modes where program is offered. Differences in methodology between sites are clearly justified. [Or: Program is only at one site/mode.]
Performance Targets			
No desired results for objectives stated.	Statement of desired result in qualitative terms (e.g., comparison to previous year's data), but no fixed target (e.g., students will perform better than last year).	Desired result specified quantitatively (e.g. 80% of our students will score a "Proficient" or "Highly Proficient" on rubric). Desired result is not justified. ("Gathering baseline data" is acceptable for this rating.)	Desired result specified AND justified (e.g., "Last year the typical student scored 20 points on measure x. The current cohort underwent more extensive coursework in the area, so we hope that the average student scores 22 points or better.")
Performance Level: Presentation of Results			
No results presented	Results are presented in summary form with respect to performance criteria. (e.g. "Students performance met our criteria.")	Results are presented, and they directly relate to the objectives and the desired results for objectives (e.g. 78% of students scored "Proficient" or "Highly Proficient,"). Statistical analysis may or may not be present. Raw data is not provided.	Results are presented, and they directly relate to objectives and the desired results for objectives, are clearly presented, and were derived statistical analyses, as appropriate. Raw data is provided in attachments or appendices.
History of Results			
No results presented	Only current year's results provided.	Past iteration(s) of results provided for some assessments in addition to current years.	Past iteration(s) of results provided for majority of assessments in addition to current years.

Faculty Discussion			
No evidence of communication of results to faculty and others.	Results from assessment provided to limited number of faculty or communication process with program faculty is unclear (not in minutes)	Results from assessment provided to all faculty, and mode and details of communication are clearly described.	Information provided to all program faculty, mode and details of communication clear (e.g. meeting dates, minutes, etc.). In addition, information shared with others such as advisory committees or other stakeholders.
Interpretation			
No interpretation attempted	Limited narration of results. Interpretation attempted, but the interpretation does not refer back to the objectives or desired results of objectives, or interpretations are not clearly supported	Some narration of assessment analysis and results. Interpretation of results seem to be reasonable inferences given the objectives, desired results of objectives, or limited methodology or discussion (e.g. only reviewed by a single faculty member).	A complete and clear narration and analysis of the assessment results. Interpretations of results seem reasonable. Multiple faculty are involved in interpreting results. Interpretation includes discussion of context: how classes/activities might have affected results, whether positively or negatively.

OREGON TECH PROGRAM ASSESSMENT REPORT RUBRIC (Section 7)			
Action Drivers			
1 – Beginning	2 – Developing	3 – Good	4 – Exemplary
No improvement plans are outlined.	Some areas where performance is below targets results in plans to collect further data, program improvements, or assessment improvements.	All areas where performance is lower than targets result in either (1) plans to collect further data, (2) program improvements, or (3) assessment method improvements. [Or: no areas fall below performance thresholds.]	All areas where performance is lower than targets result in either (1) plans to collect further data, (2) program improvements, or (3) assessment method improvements. Further opportunities for program improvement are identified, such as areas where targets are met but improvement is still possible.
Action Specifics			
No mention of any improvements to specific activity or courses.	Examples of improvements documented, but they are poorly described, and the link between them and assessment findings is not clear.	Plans to improve) are documented and directly related to the findings of assessment. However, improvements lack close ties with specific assessment findings, lack details, or are developed simply based on "best intuition" of program faculty.	Plans to make program, curricular, or course improvements or plans to improve) are documented and clearly relate to findings of assessment (e.g. specific criteria that fall below desired performance levels). Improvements draw upon knowledge of best practices in the field to maximize likelihood of success and make sense in the context of a rational, vertically-designed curriculum.
Accountability			
No information is there on how the modifications will be re-evaluated, when and by whom.	Incomplete information is included on implementation timelines, responsible parties, and re-assessment plans.	Most information on implementation plan is included (timeline, responsible parties, re-assessment schedule) is included.	All modifications include timeline for implementation, names of responsible parties, and identify when re-assessment will occur (whether at the next time the outcome comes up in the assessment cycle or sooner).

Planning and Budgeting			
No attempt at aligning improvement plans with planning and budgeting processes. No recognition or discussion of resource needs to implement improvement plan.	Minimal or vague attempt at integrating improvement plans and planning and budgeting processes. (Acknowledgment that resources may be required, but doesn't specify or quantify then.)	Meaningful attempt at integrating improvement plans and planning and budgeting processes. Plan begins to quantify resource needs.	Improvement plan articulates needed resources and implementation plan explicitly feeds in to planning and resource request processes (e.g. staffing, equipment, etc.).
Improvements in Assessment Process			
No recommendations in improving the program assessment practices.	Some critical evaluation of past and current assessment practices, including acknowledgment of flows. Minimal or surface-level recommendations in improving the program assessment practices.	Critical evaluation of past and current assessment, including acknowledgement of flaws. Some evidence of recommendations for revision improving the program assessment practices.	Critical and specific evaluation of past and current assessment, including recognition of flaws. Detailed recommendations for the improvement of the assessment practices in the program (changing methodology, collecting supplementary data, etc.), drawing upon specific analysis of past flaws in and best practices in assessment.

OREGON TECH PROGRAM ASSESSMENT REPORT RUBRIC (Section 8)			
Closing the loop			
1 – Beginning	**2 – Developing**	**3 – Good**	**4 – Exemplary**
No evidence of assessment concerning data following past curricular or programmatic changes.	Some evidence is presented to suggest improvement in student learning in response to program modifications. Evidence or improvements are vague and/or not clearly presented.	Evidence, from direct measures, suggesting learning curricular and/or pedagogical modifications, RE assessed, and found that student learning improved. Lack of clarity regarding the interventions or methodological issues (unrepresentative sampling, concerns regarding student motivation, etc.) leave legitimate questions regarding the improvement interpretation.	Strong evidence, from direct measures, supporting substantive and/or pedagogical modifications, RE-assessed, and found that student learning improved. The rationale and explanation of the modifications leading to the change are clearly laid out. The methodology is of sufficient strength that most reasonable alternative hypotheses can be ruled out (e.g., sampling concerns, validity issues with instrument or student motivation), and it is plausible to conclude that the improvement activity prompted improvement in student performance.

Contents

I.   Communication Studies Program Mission and Educational Objectives

A. *Program Mission*

The Communication Studies Program prepares students for the challenges of a society that is shaped by communication. As participants in the program, students develop and integrate knowledge, creativity, ethical practice, and skills. Students also examine and produce work in oral, written, and visual communication and practice skills in group and intercultural communication.

B. *Mission Alignment*

The Communication Studies degree typically culminates in an externship, offering students a chance to practice their target career with a current professional. Prior to that hands-on experience, Communication courses offer a variety of open-ended projects and opportunities to engage with professional or public communities as objects of study for research (e.g. COM 326: Communication Research) or practice (e.g. COM 425/426: Mediation and Mediation Practicum).

As every student's 36-credit focused sequence (see below) creates a unique degree program, innovation is a regular feature of the curriculum – students' programs of study vary as much as the students themselves. AY 2018 saw the development of a new introductory-level Communication technologies course (COM 135) meant to support other Communication Studies courses and Business/Marketing courses many students take in their focused sequence. This course will be piloted in AY 2019, with initial artifacts collected for a longitudinal assessment across technology-oriented courses addressing COM PSLO 5.

C. *Additional Information*

The Communication Studies program fills a niche in the Human and Professional Communication world by offering students the opportunity to design a major particular to their career goals. All students are required to complete 36 credit hours in courses of their choosing, forming a Focused Sequence tailored to their individual professional goals. These courses may come from within the Communication department, but many students enroll in courses from Business, CSET, and Psychology to gain specific technical expertises in addition to the interpersonal communication knowledge and skill they gain in a Communication Studies program.

The diversity of our students' career goals results in a graduate body that does not conform to a single mold. Graduates have pursued careers in law enforcement, education, management and marketing, while others have moved on to Communication-focused graduate programs. Each student is guided by their advisor to craft their focused sequence. The student to faculty ratio in our program (69:13 across AY 2018, 48:13 in Fall 2018, Week 4) allows students to work with an advisor with some expertise in their career goal.

Focused Sequence information can be found in II. F. Learning Experiences.

II.   Program Description and History

The Communication Studies program fills a niche in Communication programs nationally. Rather than focus on content production within a specific medium (e.g. television or radio broadcast) or on the dynamics of interpersonal communication, the Communication Studies B. S. gives students the flexibility to craft their own program of study. Students do gain experience in content production through courses like COM 248: Digital Media Production and COM 309: Communication Technology in Use, and they do gain experience in interpersonal communication through OIT's general education requirements and courses like COM 205: Intercultural Communication and COM 347: Negotiation and Conflict Resolution. However, these experiences are the foundations for students to develop their specific professional interests.

III.   Program History: AY 2014 to Present

The Communication Studies program was revised and approved by the CPC in Winter 2014. All new courses within the major have been rolled out, but many courses in the major are offered once per year or once per two years. As a result, initial PSLO data has not been collected in many of these courses. Within the same department, the Professional Writing program was approved in Winter of 2017 and its first courses launched in Winter 2018. While it is a distinct program from Communication Studies, the two share many faculty and some courses. As this report discusses in section V: Assessment Cycle of Student Learning Outcomes, the PSLO assessment cycle is undergoing active revision to more efficiently assess these programs.

A. Program Locations

All Communication Studies students are located on the Klamath Falls campus, but the department is developing hybrid and online offerings to make the major more appealing to students in other locations. Communication faculty are present on the Klamath Falls campus (10), the Portland-Metro campus (2) and online (1).

The program serves primarily Communication Studies majors, but also serves students in other fields interested in communication-related course work to complement their chosen major.

B. Enrollment and Retention Trends

According to FAST data, there were 44 total Communication Studies majors in Fall 2018, including 11 first year students, 8 sophomores, 6 juniors and 14 seniors. 7 additional students joined the major during AY 2018.

	AY 2016	AY 2017	AY 2018
Total Students	56	46	51
Graduated at End of Year	8	11	14
Retained from Previous Year	29	23	27

Table 1: Communication Studies B. S. Enrollment and Retention

Retention numbers are presented above by class standing and only count students persisting from year to year. As the Communication Studies program has many students who transfer in from

Community College programs or from other programs at OIT, common retention data focused on first-time freshmen would not accurately describe our retention figures.

C. *Program Graduates*
In AY 2018, 14 students graduated with a Communication Studies B. S. One student also majored in Population Health Management, and another majored in Management (Small Business Option).

D. *Industry Relationships*
The Communication department as a whole does not maintain industry relationships beyond its advisory board, which includes school board members, Jeld-Wen employees and members of the community.

During AY 2018, the Communication department continued its membership in the MadCap Scholar Program, which grants access to the professional MadCap Flare suite of technical writing applications for students (normally $1,799 per license).

E. *Learning Experiences*
In April of 2019, six students presented papers at the Northwest Communication Association's annual conference in Coeur d'Alene, Idaho. These students experienced an academic conference in its entirety, networking with faculty from colleges and universities around the Pacific and Inland Northwest. Their work was presented at the same level as graduate students and faculty.

F. *Program Changes*
The Communication Studies B. S. has no programmatic changes from AY 2017 to AY 2018 due to formal assessment data. Some programmatic changes are occurring due to changes in the faculty and student bodies, but the results will not be known until AY 2018 or AY 2019.

Due to informal focus-group–style data (focused discussion in department and curriculum group meetings) regarding student preparedness to use technology relevant to communication professions (COM PSLO 5), the Communication department designed a new course focused on advanced tools in professional communication software (e.g. Apache OpenOffice or Microsoft Office). This class will be piloted in AY 2019.

Additionally, the assessment coordinator worked individually with faculty through AY 2018 to chart expected development along COM PSLO 5 to begin coordinating the activities of several classes that had previously been offered irregularly and without formal oversight. Early results of that coordination will be discussed in the AY 2019 assessment report.

IV.   Program Education Objectives and Program Student Learning Outcomes (PSLOs)
A. *Program Education Objectives*
Upon completion of the Communication Studies program, students should be able to:

1. Apply appropriate communication skills across settings, purposes, and audiences.
2. Demonstrate knowledge of communication theory and application.

3. Practice critical thinking to develop innovative and well-founded perspectives related to the students' emphases.
4. Build and maintain healthy and effective relationships.
5. Use technology to communicate effectively in various settings and contexts.
6. Demonstrate appropriate and professional ethical behavior.

B. Program Student Learning Outcomes

Students with a bachelor's degree in Communication Studies should be able to:

1. Demonstrate critical and innovative thinking
2. Display competence in oral, written, and visual communication
3. Apply communication theories
4. Understand opportunities in the field of communication
5. Use current technology related to the communication field
6. Respond effectively to cultural communication differences
7. Communicate ethically
8. Demonstrate positive group communication exchanges

C. Origin and External Validation

The program objectives are reviewed annually by the department and at each advisory board meeting. They are implicitly discussed at each CSAC (Communication Studies Advisory Committee) meeting, occurring twice per academic term, as individual students' programs of study are reviewed.

The Communication department has not yet begun external validation of these outcomes nor assessment of student proficiency after graduation. In AY 2019, the department will pilot an informal self-assessment of program graduates, hopefully creating a regular graduate assessment routine beginning in AY 2020.

V. Curriculum Map

The AY 2017 assessment report concluded that the existing curriculum map's focus on individual courses for particular PSLOs and the resulting assessment cycle was suboptimal for a small program with such rapidly changing programs of study (i.e. focused sequences). As a result, a fuzzy ISM analysis (Singh & Garg, 2007) was conducted on courses taught during AY 2018 to begin remapping the curriculum according to faculty perceptions of where each PSLO was emphasized. This mapping process is intended to be recalibrated academic each year. Most courses are taught by the same faculty member or small group of faculty members each year, likely resulting in minimal change in the map over time, but it is believed that this continual recalibration of our map will improve the data received in our annual assessment cycle.
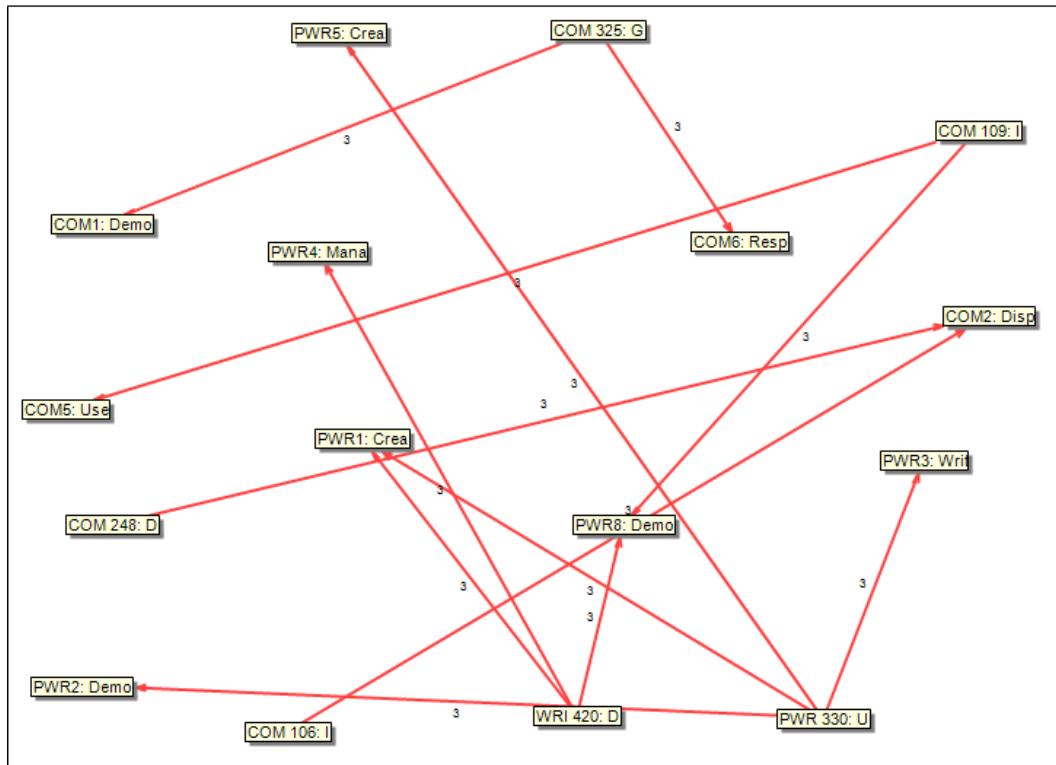
Figure 1: MICMAC Direct Influence Graph, Strongest Influences Only (cf. Godet & Bourse, 2010)

Figure 1 above shows the courses and PSLOs[1] with the most direct, dependent connections to each other – what we might consider the core of our program. Figure 2 below, while more difficult to read, shows the degree of connection between courses and PSLOs with some influence on each other. These maps were generated using the LIPSOR MICMAC method developed by Godet and Bourse (2010). Arrow-heads on lines indicate the direction of influence.

This map was developed by asking each faculty member teaching an in-major course during AY 2018 to rate the importance of each PSLO in determining a student's final grade. Ratings were ranked nominally as Necessary, Important, Tangential or Not Assessed. In the LIPSOR method, impactors are rated on a scale from 3 (strong influence) to 0 (no influence) on other variables, and the software then uses these ratings to determine the structural relationships between variables based on those impacts. In our map, if demonstration of a PSLO had a definite impact on a student's grade (the Necessary rating), this was ranked as a 3. Important ratings were ranked as 2, Tangential as 1 and Not Assessed as 0. Because faculty in the Communication department often rotate courses

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[1] Maps include both COM and PWR prefixes. Communication and Professional Writing course sequences have several overlapping courses, and department faculty teach in both areas. Additionally, Communication and Professional Writing have several similar PSLOs. Rather than attempt to extricate Communication-specific data from the complete set, this report and the Professional Writing report will present shared curriculum mapping data.
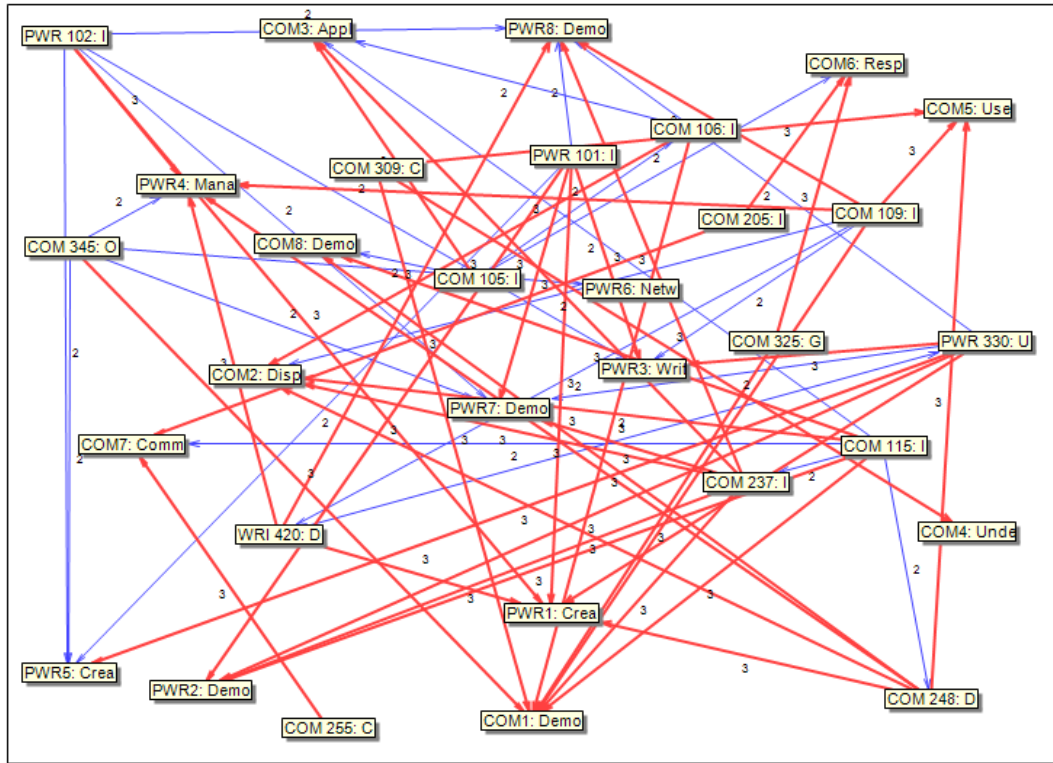
Figure 2: MICMAC Direct Influence Graph, Strongest and Relatively Strong Influences Only (cf. Godet & Bourse, 2010)

between each other, it is assumed that their subjective evaluations need no additional external validation (cf. Buyserie, Macklin, Frye, & Ericsson, 2019, forthcoming).

Because only one round of responses has been collected and because not all Communication courses are offered in a single academic year, the map is not yet complete. In examining impactors only, a preliminary revised curriculum map would look as follows. Checkmarks indicate a course with a Relatively Strong or Strong influence on a student's PSLO development. The AY 2019 assessment report will have gathered sufficient data to indicate expected degrees of mastery in each PSLO and observed student performance in almost all Communication courses.

Course	COM 1 Demonstrate critical and innovative thinking	COM 2 Display competence in oral, written, and visual communication	COM 3 Apply communication theories	COM 4 Understand opportunities in the field of communication	COM 5 Use current technology related to the communication field	COM 6 Respond effectively to cultural communication differences	COM 7 Communicate ethically	COM 8 Demonstrate positive group communication exchanges
COM 104: Introduction to Communication	Insufficient rating data							
COM 105: Introduction to Communication Theory						✓		
COM 106: Introduction to Communication Research		✓			✓			
COM 109: Introduction to Communication Technology	✓				✓			
COM 115: Introduction to Mass Communication	✓	✓					✓	✓
COM 205: Intercultural Communication						✓	✓	
COM 216: Essentials of Grammar and Punctuation	Insufficient rating data							
COM 225: Interpersonal Communication	Insufficient rating data							
COM 237: Introduction to Visual Communication	✓	✓						
COM 248: Digital Media Production		✓			✓			✓
COM 255: Communication Ethics							✓	
COM 276: Democracy and Media	Insufficient rating data							
COM 301: Rhetorical Theory and Application	Insufficient rating data							
COM 305: Contemporary Rhetorical Theory	Insufficient rating data							
COM 309: Communication Technology in Use	✓		✓	✓				
COM 325: Gender and Communication	✓					✓		
COM 326: Communication Research	Insufficient rating data							
COM 345: Organizational Communication I	✓							
COM 347: Negotiation and Conflict Resolution	Insufficient rating data							

COM 358: Communication and the Law	*Insufficient rating data*				
COM 424: Capstone	*Insufficient rating data*				
JOUR 211: Publication / Student Newspaper	*Insufficient rating data*				
SPE 314: Argumentation	*Insufficient rating data*				

Table 2: Preliminary Curriculum Map by PSLO and Course

VI.   Assessment Cycle of Student Learning Outcomes

Along with recalibrating the curriculum map each year, the Communication department will collect artifacts across most or all of its courses offered, with each faculty member rating a sample of them on all PSLOs. This method follows a model put forth by Buyserie et al. (2019, in press). It assumes that all faculty in a program can act as expert readers of student work produced in that program. While the method loses some finer definition of individual students' performances in each artifact, it does allow for wide-spread data collection and comparison within an individual program.

The previous assessment cycle is noted below. For continuity's sake, this report will offer extra discussion of the PSLOs intended for assessment this year: PSLO 6, 7 and 8.

Learning Outcomes	'14-'15	'15-'16	'16-'17	'17-'18	'18-'19	'19-'20
PSLO 1: Critical Thinking				●		●
PSLO 2: Competence in Comm	●		●			
PLSO 3: Communication Theory			●	●		
PSLO 4: Opportunities in Field			●			
PSLO 5: Use of Technology	●					
PSLO 6: Cultural Communication		●			●	
PSLO 7: Ethics		●			●	
PSLO 8: Group Communication		●[2]			●	

Table 3: Communication Studies Assessment Cycle prior to AY 2018

VII.   Summary of 2018-2019 Assessment Activities

The Communication Studies faculty participated in formal assessment of the Ethical Reasoning Essential Studies Learning Outcome (ESLO ER). Direct and indirect assessments of PSLO 6 (Cultural Communication), PSLO 7 (Communication Ethics) and PSLO 8 (Group Communication), the scheduled PSLOs for this cycle, are discussed below.

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[2] A combination of a relatively low number of upper-division Communication Students and a very small number of courses that have a graded group work component, Group Communication was not assessed this year (one class had one major group project, but, given the small size of the class, there were only three articles of student work, which is too small of a sample to provide meaningful results).

Indirect assessments were formed by taking up to five years (AY 2014-2018) of final grade data from FAST, examining student performance in a series of courses (described below). This data is compared to responses in the Student Exit Survey, broadly measuring the agreement between students and faculty about their performance in these outcomes. This inexact process helps fill the gaps in artifact gathering, though it is complicated by a limited response rate from graduating Communication Studies students graduating in Spring 2017 (response n = 5).

Direct assessments were conducted through Portfolium. While faculty continued to have access to Blackboard courses when artifacts were collected, CMS platform changes and other internal workload concerns limited artifact collection. Due to an initial error in setting up the assessment process on Portfolium, each artifact was only rated once. Future reports will include multiple raters per artifact and measures of inter-rater reliability.

Further, **direct assessments** were conducted using a career-long, nominal scale. This scale is not intended to be used by untrained or non-expert raters, and therefore does not intend to be reliable if used by individuals outside the Communication department's current faculty roster. Instead, the goal is to be both reflexive and trustworthy (cf. Lincoln & Guba, 1985), prompting faculty discussion of student performance and desired changes. The scale is presented in Appendix C: Direct Assessment Rating Scale.

As there is some overlap in courses relevant to each PSLO discussed in this report, readers are encouraged to consult Table 2: Preliminary Curriculum Map by PSLO and Course above to see how each course fits in the curriculum overall. Course descriptions are included in Appendix B: Assessed Course Descriptions.

    A. PSLO 6: Cultural Communication
       1) Indirect Assessment: Student Exit Survey and Course Grades
All students rated themselves as having "High Proficiency" in ESLO 6 (Diverse Perspectives), but only three students rated themselves as having "High Proficiency" in COM PSLO 6: Respond effectively to cultural communication differences (stated in that language on the exit survey). The other two rated themselves as "Proficient."

In comparison, courses that faculty rated as having a strong Cultural Communication component (COM 106, COM 205, COM 325) saw a similar rate from the faculty perspective. Again, as noted above, grades in these courses are not solely based on PSLO performance, but faculty teaching these courses have indicated that PSLO 6 plays a strong role in a student's overall grade. In this indirect look at student performance, it is worth noting that the sophomore-level course (COM 205: Intercultural Communication) saw the largest split between what we might consider "High Proficiency" in course content ("A" scores) and "Proficiency" in course content ("B" and "C" scores).

The cause in this dip cannot be determined from these data, but it is worth noting that a similar trend can be seen over the last five years, indicating that it is unlikely to be a cohort effect. COM 205

does feature a broader survey of content, and future assessments of ESLO 2 (Inquiry and Analysis) and COM PSLO 3 (Apply communication theories.) should examine artifacts from this course if that dip in performance grows or if students are unable to transfer knowledge from that course into other contexts.

AY2018	A	B/C	Below C	AY2014-AY2018	A	B/C	Below C
COM 106	35% n=(6)	53% n=(9)	12% n=(2)	COM 106	56% n=(37)	33% n=(22)	11% n=(7)
COM 115	33% n=(5)	53% n=(8)	13% n=(2)	COM 115	43% n=(28)	45% n=(29)	9% n=(6)
COM 325	100% n=(6)	0% n=(0)	0% n=(0)	COM 325	88% n=(30)	12% n=(4)	0% n=(0)

Table 4: Final Grades for PSLO 6 Relevant Courses: AY 2018 (Blue) and AY 2014-2018 (Yellow)

All students credit their time at Oregon Tech and in the Communication Studies program "very much" in developing this ability. Of these students, only one had started their academic career in a different program (Medical Imaging), transferring to Communication Studies as a junior. The exit survey did not ask how much prior majors (if any) contributed to learning outcomes.

Again, this is a small set of responses from a small program, so the results must be viewed as the individual experiences of these students, rather than a robust assessment of the program as a whole.

2) *Direct Assessment: Performance in COM 106: Introduction to Communication Research and Other Courses*

COM 106 concludes with an academic literature assignment applying a communication theory learned in COM 104 and/or COM 105 to a specific instance or medium of communication (e.g. media selectivity and social media feeds). This course follows COM 105, which provides a general introduction to Communication theories as a whole, and precedes COM 326, in which they use their literature review assignment as the foundation for a term-long research study.

The nature of this course as part of a core scaffold in the Communication Studies program and of the Communication Studies student body (composed of traditional college students in their first major, advanced students who have changed majors and non-traditional students) does not imply clear "starting point" for performance. Further, because students were applying theory in Communication Studies—a field heavily focused on cultural contact zones—it is unsurprising that students generally performed at least as expected.

However, the assignment does not explicitly require students to demonstrate an understanding of cultural communication differences. The two artifacts that were not rated as Advanced or Beginning Student were preparing to study monocultural groups and, as a result, did not have an opportunity to demonstrate PSLO 6.

Course	Expert	Advanced Student	Beginning Student	Unobserved	N/A	n
COM 106		2	3		2	7
COM 115		1	3		2	6
COM 237			4		3	7

Figure 3: PSLO 6 Performance in COM 106, COM 115, COM 237

COM 115 (Introduction to Mass Communication) and COM 237 (Introduction to Visual Communication) are courses that require more attention to the effect of culture on communication. COM 115 requires an understanding of both the culture of the sending a message and the culture(s) receiving it. COM 237 likewise requires students to understand the effect of a non-verbal text on different audiences. COM 115 is typically taken in the first year of the program, while COM 237 is taken by both first- and second-year students. Of the 17 students represented in these artifacts, 10 were first-year students at the time of artifact collection.

While it should not be surprising, then, that a majority of students performed at the level of a beginning college student, it is worth noting that students were performing some degree of cultural communication competency even when not explicitly prompted to do so.

3) *Discussion: Cultural Communication*
Data indicate that Communication Studies students are generally performing as expected in PSLO 6: Respond effectively to cultural communication differences.

That they likewise perform this outcome well when unprompted (or minimally prompted by course content) is not a large surprise. A primary focus of communication theories is the interaction between a message's sender and receiver(s), a relationship that at least implicitly requires an understanding of and response to each side's cultural standpoint. As this is the first year of assessment activity using a dispersed artifact-gathering process, a longitudinal understanding of how (and where) students progress in this outcome is not yet possible. **Subsequent reports will continue to gather and report on artifacts in this PSLO.** Further, the assessment coordinator has logged the names of students whose work was collected in this assessment. Where possible, individual longitudinal growth will be discussed in future reports.

B. PSLO 7: Communicate ethically
1) *Indirect Assessment: Student Exit Survey and Course Grades*
Of the five student exit survey responses received, four students rated their ability to communicate ethically as "High Proficiency," while one rated themselves as having "Proficiency" in this area. All five rated themselves has having "High Proficiency" when prompted to rate their performance in the *Ethical Reasoning: Making Ethical Judgments* ESLO.

Comparing these self-assessments to final grade data in courses, it is worth noting that overall performance in ethics-related courses tends to trend upwards. As noted earlier, COM 115 tends to be taken in the first year. COM 205, as a heavily-enrolled general education course, is taken as soon

as students can get a seat in it (typically in their first or second year). COM 255 is typically taken by second- and third-year students.

AY2018	A	B/C	Below C		AY2014-AY2018	A	B/C	Below C
COM 115	33% n=(5)	53% n=(8)	13% n=(2)		COM 115	43% n=(28)	45% n=(29)	9% n=(6)
COM 205	41% n=(7)	47% n=(8)	12% n=(2)		COM 205	56% n=(32)	37% n=(21)	7% n=(4)
COM 255	71% n=(10)	29% n=(4)	0% n=(0)		COM 255	58% n=(29)	38% n=(19)	4% n=(2)

Table 5: Final Grades for PSLO 7 Relevant Courses: AY 2018 (Blue) and AY 2014-2018 (Yellow)

Final grade data suggests that students may be overestimating their ethical reasoning ability, whether we are judging by the COM PSLO prompt or the university ESLO prompt. **The AY 2019 report should examine artifacts demonstrating prompted and unprompted ethical reasoning and communication practices**.

> *2)* *Direct Assessment: Performance in Related Courses*

Artifacts collected from COM 106, COM 115 and COM 237 showed high proficiency in ethical communication practices. As each of the assignments were end-of-term research papers, this PSLO was demonstrated primarily through academic attribution practices – "Beginning Student" ratings went to artifacts with accurate use of APA style, while "Advanced Student" ratings went to artifacts that showed significant effort into fully and properly representing ideas within source text.

Course	Expert	Advanced Student	Beginning Student	Unobserved	N/A	N
COM 106		5	2			7
COM 115		2	4			6
COM 237		3	3	1		7

Table 6: PSLO 7 Performance in COM 106, COM 115, COM 237

While it is unsurprising that COM 106 featured the most Advanced Student ratings (as students spend the full term compiling an academic literature review through several rounds of revision and instructor feedback), it is surprising to see that COM 237 students did not carry all of those lessons forward. Whether this was due to implicit differences between the assignments themselves or to a cohort effect is unclear. **However, these gaps are being discussed in curriculum group meetings and between faculty who teach sequenced courses to improve latent knowledge activation in later courses.** As no formal effort or curriculum revision has begun, there are no results or plans to note yet.

> *3)* *Coordinated Direct Assessment: Ethical Reasoning ESLO*

The Communication Studies program submitted artifacts from two courses (JOUR 211: Student Newspaper and COM 255: Communication Ethics) for the university-wide ESLO assessment of Ethical Reasoning. During the university-wide Assessment Days, artifacts from JOUR 211 were assessed.

The rationale for including COM 255 artifacts in an Ethical Reasoning assessment is fairly straightforward: that is the course in which professional ethics are discussed explicitly and where students are graded at least partially on their ethical reasoning ability. JOUR 211 was chosen as a direct assessment course because it does not explicitly ask students to do any ethical reasoning as part of an assignment – in effect, it would allow us to see students' ethical reasoning abilities when they were not explicitly prompted to show them. The particular assignment chosen was

Ratings (see Appendix A: Ethical Reasoning ESLO Rubric) were given to two artifacts during the Assessment Days event. Rating data shows that the artifacts demonstrated an ethical reasoning ability within one step of their peers, with averaged scores within one standard deviation of peer documents. While this would suggest that Communication Studies students are skilled at applying ethical reasoning to novel situations, more data is needed.

Artifact	Judgment	Logic	Recognition	Theory
COM Student 1	2.0	2.0	3.0	1.0
COM Student 2	1.3	1.7	2.3	1.0
All OIT Artifacts	*2.2 (σ = 0.98)*	*2.1 (σ =0.90)*	*2.3 (σ =0.84)*	*2.0 (σ =0.93)*

Table 7: Ethical Reasoning "Assessment Days" Results

4) Discussion: Communicate Ethically

During the AY 2019 Convocation, many faculty noted that students seem to rate their own ethical reasoning ability much higher than faculty do. It was unclear whether that was due to the assignments assessed or if it was a genuine gap between student and faculty perceptions. Communication Studies data suggests that there is a gap between our faculty and students – while students may be rated more highly in their later courses, we still do not see 80% of our students' work as "High Proficiency" in ethical reasoning.

As noted earlier, this prompts a need for further, longitudinal assessment across situations where students are prompted to show their ethical reasoning ability and where it may be a side-factor in an assignment.

C. PSLO 8: Demonstrate positive group communication exchanges
1) Indirect Assessment: Student Exit Survey and Course Grades

Group Communication was challenging to assess. Artifacts were collected from one course assignment requiring group communication, but demonstrations of group communication was limited and inconsistent. Final grades noted in Table 8 below fail to capture group communication adequately as well – COM 115 relies on group and class discussion to investigate course content and generate topics for assignments, while COM 248 required students to work in groups to craft a large, multimedia project. While the ability to work as a member of a team was central to completing both courses, neither graded students primarily on demonstrating that outcome.

AY2018	A	B/C	Below C		AY2014-AY2018	A	B/C	Below C
COM 115	33% n=(5)	53% n=(8)	13% n=(2)		COM 115	43% n=(28)	45% n=(29)	9% n=(6)
COM 248	53% n=(10)	42% n=(8)	0% n=(0)		COM 248	56% n=(19)	38% n=(13)	0% n=(0)

Table 8: Final Grades for PSLO 8 Relevant Courses: AY 2018 (Blue) and AY 2014-2018 (Yellow)

Additionally, four out of five students rated their ability to work in teams as "High Proficiency" (as with Ethical Reasoning, the fifth rated themselves as having "Proficiency") on both the ESLO scale in the exit survey and the PSLO scale.

However, text responses on the exit survey indicated an important factor of "positive group communication" that *artifact* assessment would miss: student perception of *faculty* as a member of their in-group and work-group. Three responses in particular are reproduced below.

Faculty as Group Members in Class

1. The relationships I have formed with a few faculty members have made it easier for me to get the most out of my education, understand concepts, and learn about the world outside of the major. 2. Most faculty try to help you learn through experience and firsthand exposure to concepts. 3. Most faculty have done everything they could do for me as a student.

Faculty as Professional-Group Mentors

Cour d'Alene trip was a memorable experience. Just about all my professors were great. The most important thing was that my professors (save for two) were willing to go out of their way to help me out. They truly wish for our success and our performance is reflective of those actions.

Faculty as Fellow Members of the Student Group

1. Getting to communicate with a wide assortments of students and faculty that have similar interests as you. 2. Having professors that are more out-going with their students then any other department on campus. For example, Kevin Brown hosts is annual Comm. Parties every year, which I enjoy attending for all the great food and conversations. 3. Having a large assortment of classes to choose from. From my experiences, the communication studies degree is very flexible. 4. Honorable mention, NO MATH CLASSES.

2) Future Coordinated Direct Assessment: Teamwork ESLO

While group-crafted artifacts were collected from COM 248, direct evidence of teamwork was not consistently demonstrated. All groups were assigned an analysis explaining product design and each member's role in the group project. Of seven groups of 2-4 students, three composed a group analysis and three groups' members each composed individual memos (the seventh group started as a pair, but one student dropped the course during the project). Because the assignment instructions focused on how groups executed the project requirements, commentaries on groupwork were

limited to discussing how tasks were divided or how initial product brainstorming went. As with COM 115 and other discussion-heavy Communication courses, the *product* of positive group communication was always another artifact without discernible groupwork-based features.

3) *Discussion: Group Communication*

While future assessment efforts would benefit from better artifact collection, exit survey responses suggest that that may be the wrong direction to go. As Communication faculty member Kevin Brown regularly notes, "teamwork is a process" rather than a product. As AY 2019 is the ESLO Teamwork assessment year, the Communication Department will be discussing the best ways to assess teamwork as a practice and process. **Subsequent assessment efforts should seek ways to represent teamwork as a student perception and process**, as group work is typically the means by which work is completed rather than the goal of a task overall.

VIII.   Action Plan

As a result of formal and informal data collected in AY 2018, the Communication department has the following goals.

A. AY 2019

Following recommendations in the AY 2017 report, COM 135 (Communication Software) has been developed for its first offering in Fall 2019. This course will serve as the introductory point for all Communication students to COM PSLO 5. Artifacts will be collected in this course specifically to begin measuring longitudinal development along this PSLO, comparing performance here to COM 109, COM 248 and COM 309.

Additionally, as student self-assessments in this and the AY 2017 report are compared to faculty assessments in the form of final grades, subsequent reports will begin pulling student exit survey responses from the previous five years as well to provide a more robust comparison between student perception upon graduation and faculty perception during their program.

B. Ongoing

As discussed in the Summary of Activities section, the Communication department has shifted its assessment strategy to sample a broad set of artifacts from as many courses as possible each term. Because Communication Studies is a smaller program, this will allow us to measure achievement across the entire program each year rather than focusing on a small number of students in a few courses each year.

IX.   Closing the Loop

A. AY 2017 Report: Longitudinal Tracking

The AY 2017 report suggested that longitudinal tracking of student development could be a more meaningful data collection method than taking snapshots of individual courses each year. While this report only examines artifacts from a small set of courses, the change has led to conversation on additional ways to improve our programmatic assessment using disciplinary methodologies, such as

focus grouping faculty and student feedback or performing natural language processing of survey and reflection data.

      B.   Continuing Conversations

While the loop has not fully closed yet, the Communication department has begun work on several large-scale revisions to its program. Some of this has involved the creation of new courses, and that course creation has underscored the need to hire more faculty to handle both general education offerings and the specific technical skills we teach. This has also led to further discussion of a departmental laptop requirement or other methods of solving technological access problems.

Ultimately, while these conversations center on the allocation of financial and institutional resources, our ability to act on them is limited to (a) faculty who are willing to teach out of load until searches are approved or (b) faculty who are willing to be creative in scheduling access to institutional spaces and resources necessary for these new curricular changes to take effect.

X.   References

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Appendix A: Ethical Reasoning ESLO Rubric

Ethical Reasoning Rubric (2018-19 Assessment)

DEFINITION			
Ethical reasoning is the process of recognizing which decisions require ethical judgements, determining potential reasonable courses of action, finding support for potential courses of action, and then selecting the course of action best supported.			

CRITERIA			
	High Proficiency (4) The work *meets listed requirements* for this criterion; little to no development needed.	**Proficiency (3)** The work *meets most requirements*; minor development would improve the work.	**Some Proficiency (2)** The work needs moderate development in *multiple requirements*.	**Limited Proficiency (1)** The work does not meet this criterion: it needs substantial development in *most requirements*.
Theory: Student demonstrates knowledge of different ethical theories and codes.	The student demonstrates a developed knowledge of different ethical theories and codes, and provides rationale for their preferred theory or code.	The student demonstrates a developed knowledge of different ethical theories and codes.	The student demonstrates a basic knowledge of different ethical theories or a code. Student understands the difference between ethics and law.	The student exhibits no knowledge of different ethical theories and codes. The student may confuse legal and moral codes.
Recognition: Student can recognize decisions requiring ethical judgments.	The student is able to successfully recognize decisions requiring ethical judgments without prompting, and can clearly explain to others why they require ethical reasoning.	The student is able to successfully recognize decisions requiring ethical judgments without prompting.	The student is able to recognize decisions requiring ethical judgments with prompting.	The student is unable to recognize decisions requiring ethical judgments.
Logic: Student demonstrates knowledge of the logic of ethical reasoning.	The student can formulate and test plausible moral principles* and apply them to a case to derive a course of action.	The student can formulate basic moral principles* and apply them to a case to derive a course of action.	The student can take an existing moral principle* (possibly from a code of ethics) and apply it to a case to derive a course of action.	The student exhibits no knowledge of the logic of ethical reasoning, and/or applies it improperly/inadequately.
Judgment: Student can make and support plausible ethical decisions.	The student is able to apply ethical reasoning to novel situations and provide detailed support for their decisions, as well as refuting other possible decisions.	The student is able to make plausible ethical decisions and support them at a competent level. At this level, the student begins to generalize their reasoning to similar situations.	The student is able to make plausible ethical decisions, but their support may be rudimentary or underdeveloped.	The student does not make or support plausible ethical decisions.

XI.   Appendix B: Assessed Course Descriptions

   A. COM 106: Introduction to Communication Research

Introduces research in the communication discipline. Students find and analyze quantitative, qualitative and critical research. Introduces communication research as a process composed of methods, data-gathering, analysis, conclusions.

   B. COM 115: Introduction to Mass Communication

Provides an introduction to mass media. Focuses on understanding how media operate with emphasis on contemporary social, economic, political, cultural and ethical issues.

   C. COM 205: Intercultural Communication

Introduces basic theories and concepts of intercultural communication. Builds understanding and skills enabling students to analyze intercultural interactions and develop and practice effective communication strategies.

   D. COM 248: Digital Media Production

Study of the technical aspects of digital media design and production. Hands-on experience in creating and editing video and audio. Production of video and audio for specific contexts.

   E. COM 255: Communication Ethics

Examines typical communication situations involving ethics. Provides methodologies for critically evaluating ethical situations. Uses case approach with emphasis on application.

   F. COM 325: Gender and Communication

Introduces basic theories and concepts of culturally-derived gendered communication patterns and behaviors. Builds understanding and skills enabling students to analyze those patterns and behaviors in order to develop and practice effective communication strategies.

XII.   Appendix C: Direct Assessment Rating Scale

Communication Studies PSLO scoring uses a nominal rating scale based on the quality of student work. It is intended to cover the range of possibility in a student's work from their first term through graduation. The descriptions are intentionally left broad and subjective. As Communication technology and practices change frequently, and as each Communication student crafts their major for their own narrow career goal, the scale assumes that faculty have the expertise necessary to judge the quality of work according to these broad categories (cf. Buyserie, Macklin, Frye, & Ericsson, 2019, forthcoming).

Expert: This outcome is demonstrated at a level appropriate for a Communication professional. This is work that could be used as a class resource.

> e.g. PSLO 6: Respond Effectively to Cultural Communication Differences. The artifact might demonstrate awareness of and sensitivity to the cultural needs of its audience as well as additional audiences that may encounter the work. The artifact does not compromise the values of its creator's culture.

Advanced Student: This outcome is demonstrated at a level appropriate for someone with training in it but who is still learning its application. This is work that is rough around the edges.

> e.g. PSLO 6: The artifact might demonstrate awareness of or sensitivity to the cultural needs of its audience, but it may do so imperfectly. It might also compromise the values of its creator's culture.

Beginning Student: This outcome is demonstrated at a level appropriate for someone just learning about it. This is work that shows an ability to identify or understand the outcome, but not necessarily apply it.

> e.g. PSLO 6: The artifact might state its audience's cultural values or needs but not demonstrate any sensitivity to them.

Unobserved: This outcome could be demonstrated in the artifact, but it is not.

> e.g. PSLO 6: The artifact may be written entirely from the creator's cultural standpoint.

N/A: The outcome cannot be demonstrated in the artifact.

> e.g. PSLO 6: A student asked to create a PowerPoint template for a fictional client may not have any way to demonstrate awareness of different cultural communication values.

Bachelor of Science in Mechanical Engineering (BSME) 2018/19 Program Assessment Report

Written by Robert A. Paxton, Program Director BSME
31 October 2019

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1. Introduction

This report documents the assessment activities undertaken within the Bachelor of Science in Mechanical Engineering (BSME) program at the Oregon Institute of Technology during the 2018-19 academic year. The BSME program is delivered at three campuses within the University – Klamath Falls, Portland-Metro (in Wilsonville) and Seattle. The MMET Department's other two degree programs (the Bachelor of Science in Mechanical Engineering Technology, BSMET and the Bachelor of Science in Manufacturing Engineering Technology, BSMFG) share a number of common courses with the BSME and thus faculty input from the staff on these programs is also considered when assessing the effectiveness of several Departmental courses.

The 2018/19 academic year was challenging for the MMET Department. In July 2018, Prof. Jeffery Hayen stepped down as Department Chair after serving in the role for four years. The Department was then led by a series of acting Chairs during the Summer of 2018. In Fall 2018, Prof. Steve Adison became the interim Chair for the Department for the 2018/19 academic year. Prof. Adison immediately set about implementing a more-efficient revised management structure leading to a reshuffling of staff into different roles at short notice. At the Klamath-Falls campus, Prof. Joe Stuart became the Site Director and Prof Steve Edgeman retained his role as the Program Director for the BSMET and BSMFG degrees. At the Portland-Metro campus, Prof. Wangping Sun became the Site Director and Prof. Robert Paxton became the Program Director for the BSME. At the Seattle campus, Prof. Addison retained his role as Site Director and Program Director for the MSMFG (as well as holding the interim Chair position).

Ultimately, this meant that the Department's data collection activities for program assessment were not as highly organized or coordinated as normal. Some data was collected from the Portland-Metro campus and is presented in this report. This report will primarily serve however, as a "planning" document to allow the Department to move forward and execute a more rigorous assessment plan in the 2019/20 academic year. Details of the revised assessment plan, rubrics and curricular alignment will be discussed in the relevant sections of this report.

2. Program Mission and Educational Objectives

The mission statement of the Mechanical Engineering (ME) Program is in-line with and built upon the mission statements of both the Institution and the Department. The ME program's Mission Statement and Program Educational Objectives are stated as:

Mechanical Engineering Program Mission Statement

The Mechanical Engineering Program at Oregon Institute of Technology is an applied engineering program with a focus on hands-on, project-based learning. Its mission is to provide graduates the skills and knowledge for successful careers in mechanical engineering.

Program Educational Objectives (PEO)

The program expects graduates to achieve, within several years of graduation, the following objectives. Mechanical Engineering graduates will have:

- Demonstrated the ability to analyze, design and improve practical thermal and/or mechanical systems.
- Shown the ability to communicate effectively and work well on team-based engineering projects.
- Succeeded in entry-level mechanical engineering positions.
- Pursued continued professional development, including professional registration if desired.
- Successfully pursued engineering graduate studies and research if desired.

These PEO's were last reviewed during the 2015/16 academic year and will be reviewed again in the 2019/20 academic year to ensure their relevance.

3. Program Student Learning Outcomes (SLO)

Towards the end of 2017, ABET's Engineering Area Delegation (EAD) approved changes to criterion 3 Student Learning Outcomes (SLOs), applicable beginning the 2019/20 cycle. This remapped and consolidated the "old" 11 SLOs (a-k) into 7 "new" SLOs. Details of this remapping are included in Appendix I.

In Fall 2018, it was decided by the Chair (Prof. Addison) and the BSME Program Director (Prof. Paxton) that it would be more pragmatic and beneficial if the MMET Department began using the updated SLOs as soon as possible. This would provide the greatest amount of useful assessment data for the next accreditation visit (during the 2021/22 academic year). Unfortunately, due to a lack of communication the implementation of the new SLOs was not as successful as hoped. This led to a mix of "old" and "new" SLOs being used for assessment.

The ME program's SLOs are aligned with "new" ABET EAC SLOs. These are stated as:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

4. Three-Year Cycle for Assessment of Student Learning Outcomes

The BSME program is using a three-year assessment cycle for its SLOs, with the assessment cycle being the same for all three campuses. This cycle is set up so that each outcome is assessed at least once every three years.

One of the first tasks designated to the current Program Director (Prof. Paxton) was to remap the "old" SLOs into the "new" SLOs (discussed in Section 3). Once this was completed, the three-year assessment cycle was updated to reflect these new outcomes.

The outcomes being assessed in the 2018/19, 2019/20 and 2020/21 assessment cycles are shown in Table 1.

Table 1: Three-year assessment cycle timetable

Assessment Criteria	18/19	19/20	20/21
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.			✓
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.			✓
3. an ability to communicate effectively with a range of audiences.		✓	
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	✓		
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	✓		
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.		✓	
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.		✓	

5. Assessment Activities Undertaken 2018/19

The Mechanical Engineering faculty conducted formal assessment of two SLOs (#4, #5) during the 2018/19 academic year, as detailed in Table 1. As discussed in the introduction, assessment activities were limited during the year and only the Portland-Metro campus participated in data collection and assessment process.

The outcomes assessed during the 2018/19 academic year were:

- SLO 4: Graduates will have an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- SLO 5: Graduates will have an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

Typically, these outcomes would be mapped to the curriculum, however this has yet to be completed for the updated SLOs (and PEOs, as discussed in Section 2). At each campus the normal assessment activities for each SLO consists of two direct assessments, and one indirect assessment. However, during the 2018/19 academic year, only one direct and one indirect measure were used.

Direct assessments are evaluated using an outcome-specific rubric developed by OIT MMET Department and/or other faculty. As two different sets of SLOs were used for assessment, this necessitated the use of two sets of rubrics. During the 2019/20 academic year, the Department is hoping to establish a working committee to work on re-writing the rubrics used for assessment.

The indirect assessment used is a "senior survey", which all BSME students enrolled in the senior project sequence (ENGR491/492/493) are invited to participate in. The survey is sent out during the Spring term to each graduating senior. The survey includes questions on how well the program prepared the student on each SLO. This survey data is reviewed by faculty to determine any strengths or weaknesses as perceived by students on this SLO. The survey is common for all campuses but can be sorted to give results for individual campuses, if required. In this survey, students are asked two types of questions: 1) how proficient they believe they are in a particular SLO, and 2) How much did Oregon Tech contribute to this proficiency?

Assessment Procedures

The procedure for determining which courses are to be used for assessment activities is listed below:

1) During summer, the BSME Program Director notifies the Site Directors (at all three campuses) of the SLOs that will be evaluated in the upcoming year. The BSME Program Director also consults with the Program Directors for the BSMET and BSMFG to determine whether any overlap in assessment activities is possible (preferred option)
2) The Site Directors, using their site-specific knowledge (eg. knowledge of timetabling, course offerings, adjunct availability etc.) consult with their local faculty and determine which courses and assessment type (homework/lab report/exam etc.) are to be used for each SLO. While campuses do not have to use the same course for a particular assessment, this can sometimes be advantageous and allows the Department to look at intra-campus differences in course offerings. As "local experts", Site Directors are given significant leeway in determining which courses would be most appropriate for their particular campus, although this can be overruled by the Program Director or Chair if necessary.
3) Before the start of Fall term, the Site Directors notify the Program Director and Chair of the courses (and types of assessment) that will be undertaken by their site.
4) The Program Director (in conjunction with the Chair and Site Directors) then manages the data collection process and assessment activities throughout the academic year.
5) During summer, the Program Director collates and analyzes the assessment data and authors the Program Assessment Report (ie. this document)

6. Assessment of SLO 4: Ethical and Professional Responsibilities

As described in Section 3, SLO 4 is stated as graduates "will have an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts".

Coincidentally, in the 2018/19 academic year, this SLO was also chosen as one of the University's Essential Student Learning Outcomes (ESLO). The performance criteria for the two SLOs are compared in Table 2.

Table 2: Comparison of MMET SLO and OIT ESLO

MMET Department	Oregon Tech
SLO 4: Graduates will have an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. 1. Demonstrates knowledge of the professional code of ethics and can use it to describe ethical issues. Demonstrates knowledge and understanding of "ethical diversity". 2. Understands the global impact of engineering decisions 3. Understands the macro-economic impact of engineering solutions 4. Understands major socio-economic and political issues of engineering solutions 5. Understands the environmental and the social impact of engineering decisions 6. Describes and analyzes possible/alternative approaches and can explain the benefits and risks	ESLO 3: Oregon Tech Students will make and defend reasonable ethical judgements. 1. Theory: Student demonstrates knowledge of different ethical theories and codes. 2. Recognition: Student can recognize decisions requiring ethical judgments. 3. Logic: Student demonstrates knowledge of the logic of ethical reasoning. 4. Judgment: Student can make and support plausible ethical decisions.

Although the two assessment criteria are similar, the University ESLO is significantly vaguer. This is not surprising given that it is used to assess students from all majors and not just mechanical engineering. The SLO for the BSME expands on the University ESLO to evaluate whether students can recognize and apply ethical behavior in terms of economic, social and environmental aspects as well as the concept of ethical diversity.

SLO 4 is a combination of the "old" EAC SLOs f, h & j:

- EAC-f: An understanding of professional and ethical responsibility
- EAC-h: the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- EAC-j: a knowledge of contemporary issues). As described earlier, Faculty used a mix of both rubrics encompassing both "old" and "new criteria" leading to a convoluted overall result.

Direct Assessment Activities

For the 2018/19 academic year, faculty assessed SLO 4 using two separate exercises:

- Prof. Stover assessed "new" SLO 4 ("an understanding of professional and ethical responsibility") in MECH 316 Machine Design II in Spring term 2019, using a homework design project. There were 8 BSME, 4 BSMET and 5 BSMFGT students in this course, but only the BSME students are considered for the purposes of this report and the results are shown in Table 3 (details of each SLO can be found in column 1 of Table 2).
- Prof. Sun assessed "old" SLO h ("the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context") in ENGR 493 in Spring 2019, using the Final project report. There were 4 BSME, 1 BSMET and 1 BSMFGT students in this course, but only 3 of the 4 BSME students are considered for the purposes of this report (1 student did not submit any work, so was not counted). The results are shown in Table 4 (details of each SLO can be found in column 1 of Table 2).
- No assessment was made of "old" SLO j ("a knowledge of contemporary issues").

Table 3: Assessment Results for SLO 4 using MECH 316:
Prof. Stover, Spring 2019, Portland-Metro campus, n = 8 students

Assessment Criteria	1. Limited or No Proficiency (%)	2. Some Proficiency (%)	3. Proficiency (%)	4. High Proficiency (%)
3. Understands the macro-economic impact of engineering solutions	0	0	12.5	87.5
5. Understands the environmental and the social impact of engineering decisions	0	0	25	75
6. Describes and analyzes possible/alternative approaches and can explain the benefits and risks	0	12	12.5	75

NOTE: For this assessment item, the instructor reported criterion 1,2 and 4 as "not-applicable" and so these are not reported in Table 3.

Table 4: Assessment Results for SLO h using ENGR 493:
Prof. Sun, Spring 2019, Portland-Metro campus, n = 3 students

Assessment Criteria	1. Limited or No Proficiency (%)	2. Some Proficiency (%)	3. Proficiency (%)	4. High Proficiency (%)
Understands the global impact of engineering decisions	0	0	0	100
Understands the macro-economic impact of engineering solutions	0	0	0	100
Understands the environmental and the social impact of engineering decisions	0	0	0	100

It should be noted that the sample size for both Tables 3 & 4 is extremely small (8 and 3 students). Thus, caution should be used when trying to draw conclusions from this data.

Indirect Assessment Activities

For the 2018/19 academic year (as with past years), the student exit survey was used as the indirect assessment activity. The questions used on the survey are determined during the Fall term preceding the Spring term that the survey is sent out. For the 2018/19 academic year, the "old" SLOs were used on the student exit survey.

<u>Prompt question:</u> Please rate your proficiency in the following areas.

Table 5: Assessment Results for SLOs f, h and j using Student Exit Survey, Spring 2019

Question	Very much	Quite a bit	Some	Very little	Total
f. An understanding of professional and ethical responsibility.	50.00%	46.15%	3.85%	0.00%	26
h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.	38.46%	53.85%	3.85%	3.85%	26
j. A knowledge of contemporary issues.	42.31%	42.31%	11.54%	3.85%	26

Prompt question: How much has your experience at Oregon Tech contributed to your knowledge, skills, and personal development in these areas?

Table 6: Assessment Results for SLOs f, h and j using Student Exit Survey, Spring 2019

Question	Very much	Quite a bit	Some	Very little	Total
f. An understanding of professional and ethical responsibility.	42.31%	38.46%	11.54%	7.69%	26
h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.	44.00%	40.00%	12.00%	4.00%	25
j. A knowledge of contemporary issues.	26.92%	46.15%	15.38%	11.54%	26

As discussed in Table 2, SLO f and ESLO 3 are similar in scope, so it is interesting to compare the results from Tables 5 and 6 to these results (Tables 7 and 8).

Prompt question: Please rate your proficiency in the following areas.

Table 7: Comparison of ESLO 3 and SLO f using Student Exit Survey, Spring 2019

Question	High proficiency	Proficiency	Some proficiency	Limited proficiency	Total
ESLO 3. Ethical Reasoning: Making ethical judgements	56.67%	40.00%	3.33%	0.00%	30
SLO f. An understanding of professional and ethical responsibility.	50.00%	46.15%	3.85%	0.00%	26

Prompt question: How much has your experience at Oregon Tech contributed to your knowledge, skills, and personal development in these areas?

Table 8: Comparison of ESLO 3 and SLO f using Student Exit Survey, Spring 2019

Question	High proficiency	Proficiency	Some proficiency	Limited proficiency	Total
ESLO 3. Ethical Reasoning: Making ethical judgements	32.26%	25.81%	29.03%	12.90%	31
SLO f. An understanding of professional and ethical responsibility.	26.92%	46.15%	15.38%	11.54%	26

Analysis and Recommended Actions

Strengths:
All students demonstrated proficiency or high proficiency in their understanding of the economic, environmental and social impacts of engineering solutions (rubric criteria 3 and 5). Although 12.5% of students only show limited proficiency for criteria 6 ("describes and analyzes possible/alternative approaches and can explain the benefits and risks"), this is fact only accounts for a single student! This demonstrates the students in the BSME program are exposed and aware of the different aspects of engineering decisions.

Weaknesses:
Beginning with Table 3 (Stover, SLO 4), the primary weakness is that rubric criteria 1,2 and 4 were not evaluated! Given that the ethical aspects of SLO 4 were evaluated in criteria 1, this is a significant piece of missing information. This demonstrates that the assessment activity was not well-matched to the rubric criteria.

In Table 7, 96.15% of BSME students feel that they have a "proficient" or "highly proficient" understanding of the professional and ethical responsibilities of an engineer. However, only 73.07% of students feel that Oregon Tech contributed to this understanding. Adding the 15.38% of student who feel that Oregon Tech contributed "some proficiency" to their knowledge, and the total is still less than 96.15% This indicates that while students believe they ultimately end up with the requisite knowledge, they do not believe that the MMET Department completely gives them this knowledge.

Interestingly, when these same students are asked about ethics from a University's perspective (ESLO 3), the results are similar with 96.67% believing they have a "proficient" or "highly proficient" understanding of ethical reasoning. Similarly, only 58.07% feel that Oregon Tech contributed to this understanding.

Comparisons to previous data:
SLOs f, h and j were last assessed at the Klamath Falls and Seattle campuses during the 2015/16 academic year. SLO f was assessed using ENGR 111 (Fall 2015) and MECH 491 Senior Projects II (Fall 2015), and a summary of these results is shown in Tables 4 & 5. SLO h was assessed using MECH 491 (Fall 2015) and MECH 313 (Winter 2016 & Spring 2016), and a summary of these results is shown in Tables 6 - 8. SLO j was assessed using MECH 491 (Fall 2015) and MET 160 (Winter 2016) and a summary of these results is shown in Tables 9 & 10.

Table 9: Abridged summary of assessment results for SLO f using ENGR 111 (Fall 2015), Klamath Falls campus

Assessment Criteria	Average score
Demonstrates knowledge of the professional code of ethics	96%
Using code of ethics, describes ethical issue(s)	96%
Describes parties involved and discusses their points of view	86%
Describes and analyzes possible/alternative approaches	84%
Chooses an approach and explains the benefits and risks	94%

Table 10: Abridged summary of assessment results for SLO f using MECH 491 (Fall 2015), Klamath Falls campus

Assessment Criteria	Average score
Demonstrates knowledge of the professional code of ethics	100%
Using code of ethics, describes ethical issue(s)	96%
Describes parties involved and discusses their points of view	96%
Describes and analyzes possible/alternative approaches	93%
Chooses an approach and explains the benefits and risks	93%

Comments from this assessment activity include mention of the fact that students successfully identified stakeholders, alternative resolution scenarios, ethical/moral principles and assessment via an evaluation/decision matrix. As with the 2018/19 assessment, it appears that students continue to struggle with describing and analyzing possible and alternative approaches and being able to explain the benefits and risks of those approaches.

Table 11: Abridged summary of assessment results for SLO h using MECH 491 (Fall 2015), Klamath Falls campus

Assessment Criteria	Average score
Understands the global impact of engineering decisions.	91%
Understands the macro- economic impact of engineering solutions.	100%
Understands the environmental and the social impact of engineering decisions	100%

Table 12: Abridged summary of assessment results for SLO h using MECH 313 (Spring 2016), Klamath Falls campus

Assessment Criteria	Average score
Understands the global impact of engineering decisions.	96%
Understands the macro- economic impact of engineering solutions.	92%
Understands the environmental and the social impact of engineering decisions	92%

Table 13: Abridged summary of assessment results for SLO h using MECH 313 (Winter 2016), Seattle campus

Assessment Criteria	Average score
Understands the global impact of engineering decisions.	93%
Understands the macro- economic impact of engineering solutions.	100%
Understands the environmental and the social impact of engineering decisions	93%

Comments from this assessment activity include mention of the fact that almost all of the students had a good understanding of the global impact of portable energy, and they all had a good understanding of both the economic and environmental/social impacts. This has remained unchanged in the 2018/19 assessment and Oregon Tech students remain very aware of the world around them.

Table 14: Abridged summary of assessment results for SLO j using MECH 491 (Fall 2015), Klamath Falls campus

Assessment Criteria	Average score
Address major socio- economic issues	97%
Address US political issues	94%

Table 15: Abridged summary of assessment results for SLO j using MET 160 (Winter 2016), Klamath Falls campus

Assessment Criteria	Average score
Address major socio- economic issues	36%
Address US political issues	21%

Comments from this assessment activity state the students seemed well read on most issues. No major weaknesses were identified aside from the fact that sometimes students were given to opinion rather than stating fact.

Recommended actions:

Three recommendations are made:

1. Firstly, in future assessments care should be taken to choose an assessment item that will allow students to demonstrate their knowledge and understanding of ethical issues.
2. Secondly, a larger sample be used in order to garner more useful statistical information. Potentially, BSMET and BSMFG students could be included in the statistical analysis, since these programs have many common courses to the BSME.
3. Lastly, the MMET Department needs to investigate methods to better assist students to identify, critically evaluate and justify alternative approaches as they develop various engineering solutions.

7. Assessment of SLO 5: Teamwork

As described in Section 3, SLO 5 is stated as graduates "will have an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives".

SLO 5 is a rephrasing of the "old" EAC SLO d:

- EAC-d: An ability to function on multidisciplinary teams.

Direct Assessment Activities

For the 2018/19 academic year, faculty assessed SLO 5 using three separate exercises:

- Prof. Paxton assessed "new" SLO 5 ("an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives") in MECH 318 Fluid Mechanics in Winter term 2019 using three laboratory reports. These reports were assessed at the beginning, middle and end of the course to observe how students' abilities changed during the term. Students worked in groups composed of BSREE BSME and BSMET students, and thus it is not possible to discern the individual contributions of BSME students in this type of assessment. Additionally, the group composition changed during the term, this comparisons between assessments was not possible except in very general terms. The relative number of students were: 11 BSREE (58%), 5 BSME (26%) and 3 BSMET (16%). The results of this assessment are shown in Tables 11 – 13.

Table 16: Assessment Results for SLO 5 using MECH 318 Lab 1:
Prof. Paxton, Winter 2019, Portland-Metro campus, n = 6 groups

Assessment Criteria	1. Limited or No Proficiency (%)	2. Some Proficiency (%)	3. Proficiency (%)	4. High Proficiency (%)
1. Identifies and achieves goal/purpose	33	50	0	17
2. Assumes and fulfills roles and responsibilities as appropriate. Leadership strives to create a collaborative and inclusive environment.	0	0	100	0
3. Interacts and communicates effectively with team/group members.	0	0	100	0
5. Share appropriately	0	17	33	50
7. Documentation and record keeping	0	17	66	17

*NOTE: For this assessment item, the instructor reported criterion 4, 6 and 8 as "not-applicable" and so these are not reported in Table 3.

Table 17: Assessment Results for SLO 5 using MECH 318 Lab 3:
Prof. Paxton, Winter 2019, Portland-Metro campus, n = 6 groups

Assessment Criteria	1. Limited or No Proficiency (%)	2. Some Proficiency (%)	3. Proficiency (%)	4. High Proficiency (%)
1. Identifies and achieves goal/purpose	0	33	33	33
2. Assumes and fulfills roles and responsibilities as appropriate. Leadership strives to create a collaborative and inclusive environment.	0	0	100	0
3. Interacts and communicates effectively with team/group members.	0	0	100	0
5. Share appropriately	0	17	50	33
7. Documentation and record keeping	0	0	50	50

NOTE: For this assessment item, the instructor reported criterion 4, 6 and 8 as "not-applicable" and so these are not reported in Table 3.

Table 18: Assessment Results for SLO 5 using MECH 318 Lab 5:
Prof. Paxton, Winter 2019, Portland-Metro campus, n = 5 groups

Assessment Criteria	1. Limited or No Proficiency (%)	2. Some Proficiency (%)	3. Proficiency (%)	4. High Proficiency (%)
1. Identifies and achieves goal/purpose	20	20	40	20
2. Assumes and fulfills roles and responsibilities as appropriate. Leadership strives to create a collaborative and inclusive environment.	0	0	100	0
3. Interacts and communicates effectively with team/group members.	0	0	100	0
5. Share appropriately	0	0	100	0
7. Documentation and record keeping	0	0	100	0

NOTE: For this assessment item, the instructor reported criterion 4, 6 and 8 as "not-applicable" and so these are not reported in Table 3.

Indirect Assessment Activities

For the 2018/19 academic year (as with past years), the student exit survey was used as the indirect assessment activity. The questions used on the survey are determined during the Fall term preceding the Spring term that the survey is sent out. For the 2018/19 academic year, the "old" SLOs were used on the student exit survey.

Prompt question: Please rate your proficiency in the following areas.

Table 19: Assessment Results for SLO d using Student Exit Survey, Spring 2019

Question	Very much	Quite a bit	Some	Very little	Total
d. An ability to function on multidisciplinary teams	38.46%	57.69%	3.85%	0.00%	26

Prompt question: How much has your experience at Oregon Tech contributed to your knowledge, skills, and personal development in these areas?

Table 20: Assessment Results for SLO d using Student Exit Survey, Spring 2019

Question	Very much	Quite a bit	Some	Very little	Total
d. An ability to function on multidisciplinary teams	26.92%	30.77%	30.77%	11.54%	26

Similar to the previous discussion, there is some similarity to SLO d and University ESLO 4 (Teamwork: Work effectively with groups and teams). Thus, it can be informative to compare the results of both the SLO 5/d and ESLO 4).

Prompt question: Please rate your proficiency in the following areas.

Table 21: Comparison of ESLO 3 and SLO d using Student Exit Survey, Spring 2019

Question	High proficiency	Proficiency	Some proficiency	Limited proficiency	Total
ESLO 4. Teamwork: Work effectively with groups and teams	53.33%	43.33%	3.33%	0.00%	30
SLO d. An ability to function on multidisciplinary teams	38.46%	57.69%	3.85%	0.00%	26

Prompt question: How much has your experience at Oregon Tech contributed to your knowledge, skills, and personal development in these areas?

Table 22: Comparison of ESLO 3 and SLO d using Student Exit Survey, Spring 2019

Question	High proficiency	Proficiency	Some proficiency	Limited proficiency	Total
ESLO 4. Teamwork: Work effectively with groups and teams	29.03%	38.71%	29.03%	3.23%	31
SLO d. An ability to function on multidisciplinary teams	26.92%	30.77%	30.77%	11.54%	26

Analysis and Recommended Actions

Strengths
Students clearly benefit from the feedback received – in the final assessment, all groups achieved proficient or higher in the final lab report for most of the performance criteria, a noticeable increase from the first assessment item.

Weaknesses
An unusually high number of students showed "low" or "some" proficiency for the final assessment, after most groups showed "proficiency" or "high proficiency" for the mid assessment. This is attributed to the fact that the final assessment was due in Finals week, and students were likely preoccupied with their other final exams.

Comparing the data for ESLO 3 and SLO d (Table 21), it is interesting that the number of students who rank themselves as "proficient" or "highly proficient" is almost identical (96.66% and 96.15%). However, when asked whether Oregon Tech contributed to this proficiency, 67.74% felt it had when considering the University ESLO and only 57.69% when considering the EAC SLO.

In Table 7, 96.15% of BSME students feel that they have a understanding of the professional and ethical responsibilities of an engineer. However, only 73.07% of students feel that Oregon Tech contributed to this understanding. Adding the 15.38% of student who feel that Oregon Tech contributed "some proficiency" to their knowledge, and the total is still less than 96.15% This indicates that while students believe they ultimately end up with the requisite knowledge, they do not believe that the MMET Department completely gives them this knowledge. Thus, one could conclude that most students end up with proficiency in teamwork, but at least some of this proficiency is being gained through non-ME courses or activities.

Comparisons to previous data:

SLO d ("graduates will be able to function on multi-disciplinary teams") was last assessed at the Klamath Falls campus during the 2015/16 academic year using MECH 437 (Winter 2016) and MECH 492 (Spring 2016). A summary of these results is shown in Tables 14 & 15.

Table 23: Abridged summary of assessment results for SLO d using MECH 437 (Winter 2016), Klamath Falls campus

Assessment Criteria	Average score
Identify and achieve goal/purpose	100%
Assume roles and responsibilities as appropriate	100%
Interact appropriately with team/group members	100%
Recognize and help reconcile differences among team/group members	100%
Share appropriately in work of team/group.	100%
Develop strategies for effective action.	100%
Cultural Adaptation.	100%

Table 24: Abridged summary of assessment results for SLO d using MECH 492 (Spring 2016), Klamath Falls campus

Assessment Criteria	Average score
Identify and achieve goal/purpose	80.0%
Assume roles and responsibilities as appropriate	77.0%
Interact appropriately with team/group members	64.5%
Recognize and help reconcile differences among team/group members	63.5%
Share appropriately in work of team/group.	59.0%
Develop strategies for effective action.	72.5%
Cultural Adaptation.	87.0%

Comments from this assessment activity indicated that the instructors felt that the students showed excellent teamwork skills. This is replicated in the 2018/19 assessment, where students continue to form good working relationships with their peers. One observation that students made in 2015/16 was group work became challenging when the group size exceeded 6 students. This was corrected in the 2018/19 assessment by only allowing groups of 2-4 students.

Recommended actions

A method needs to be found to discriminate the contributions of BSME, BSMET, BSMFG and BSREE students. At present, groups form organically and consist of students from multiple programs. Additionally, a method should be found to assess the individual contributions of each student.

8. Summary of Student Learning Outcomes & Actions Taken

As mentioned in the introduction to this report, the assessment activities for the 2018/19 academic year were limited to one direct and one indirect assessment activity. Additionally, assessment was only conducted by one of the three campuses. However, from this limited amount of data the following conclusions can be drawn:

- SLO 4: Students appear to continue to struggle with identifying, critically evaluating and justifying alternative approaches/solutions to engineering problems.
  ACTION: The Program Director will write to all staff, asking them to try and ensure that their students think of the "bigger picture" when undertaking assessment items. In the 2022/23 academic year (when SLO 4 is next evaluated), this point will be further emphasized to staff.
- SLO 5: Students continue to work very collaboratively with each other. It appears that the fact that these students are in enrolled in different degrees (or majors) has little to no bearing on their ability to work together to achieve a good result. This is extremely encouraging and suggests that Oregon Tech graduates should easily be able to work in multidisciplinary teams.

Additional actions suggested for the 2019/20 academic year

- In the 2015/16 report, it is stated that Program Educational Objectives (PEO) were currently under review. However, it is unclear what the outcomes of this review were. This needs to be clarified.
- The curriculum map needs to be updated to reflect changes in the program SLOs.
- The rubrics used for assessment need to be re-written to reflect the updated ABET SLOs being assessed. Draft rubrics are shown in Appendix II.
- Two direct and one indirect assessment activity needs to be completed for each SLO at each campus for the 2019/20 academic year.
- Overall communication between the three campuses needs to be improved to ensure consistency between assessment activities.

APPENDIX I: EAC SLOs Comparing "Old" And "New" Language

Current Language EAC Criteria effective 2017-18 and 2018-19 Cycles	New Language Approved by the EAD October 20, 2017 Applicable beginning in the 2019-20 cycle
Criterion 3. Student Outcomes The program must have documented student outcomes that prepare graduates to attain the program educational objectives. Student outcomes are outcomes (a) through (k) plus any additional outcomes that may be articulated by the program.	Criterion 3. Student Outcomes The program must have documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering. Student outcomes are outcomes (1) through (7), plus any additional outcomes that may be articulated by the program.
(a) an ability to apply knowledge of mathematics, science, and engineering (e) an ability to identify, formulate, and solve engineering problems	1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
(b) an ability to design and conduct experiments, as well as to analyze and interpret data	6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
(d) an ability to function on multidisciplinary teams	5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
(f) an understanding of professional and ethical responsibility (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (j) a knowledge of contemporary issues	4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
(g) an ability to communicate effectively	3. an ability to communicate effectively with a range of audiences
(i) a recognition of the need for, and an ability to engage in life-long learning	7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	Implied in 1, 2, and 6

APPENDIX II: Rubrics Used For Assessment

Draft versions of the rubrics to be used for assessment activities are listed below. Some faculty used these rubrics in 2018/19 in order to evaluate their effectiveness. These rubrics will be reviewed during the 2019/20 academic year. Listed in the rubrics is "old" EAC language (a-k) and "new" EAC language (1-7) to allow comparisons to be made. Refer to Appendix I for details of how the "old" SLOs have been remapped to the "new" SLOs.

"NEW" EAC SLO 01: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and
mathematics

"OLD" EAC SLO a: Graduates will have the ability to apply mathematics, science and engineering.
"OLD" EAC SLO e: Graduates will be able to identify, formulate, and solve engineering problems.

Performance Criteria	(1) Limited or No Proficiency	(2) Some Proficiency	(3) Proficiency	(4) High Proficiency
1a) Identifies an engineering problem.	Does not identify the problem clearly.	Defines problem but has missing elements or does not include important information.	Adequately defines problem, including sufficient basic information.	Clearly identifies problem or reiterates given problem, including underlying principals and scope. Demonstrates depth of understanding.
1b) Formulate a plan which will lead to a solution, including making appropriate assumptions.	Unable to develop a coherent plan to solve the problem. Does not identify assumptions or constraints, or makes errors in attempting to do so.	Develops a marginal plan with some important elements missing. Identifies some assumptions and constraints but important elements are missing.	Develops an adequate plan that leads to a plausible solution. Identifies basic assumptions and constraints.	Develops a coherent and concise plan to solve the problem with alternative strategies and a clear path to solution. Plan smoothly flows from problem statement and assumptions. Clearly delineates realistic constraints & important assumptions that affect solution. Includes assumptions that are workable, usable, and/or valid.

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1c) Identify the engineering principles that govern the performance of a given process or system, and use these to analyze the problem (utilizing appropriate hardware and software technology tools).	Unable to apply prerequisite engineering concepts to new problems. Makes significant errors in computation and/or logic. Does not use appropriate principals for analysis. Unable to select and apply appropriate technology tools or does not demonstrate understanding of tools selected.	With extensive guidance, applies prerequisite engineering concepts to new problems. Computations may not include all important elements or steps. Order may not be logical and analysis incomplete with some elements missing. With extensive guidance, selects and properly applies appropriate technology tools. Demonstrates some understanding of tools selected.	Applies prerequisite engineering concepts to new problems, but may need some guidance. Correctly performs basic computations in a logical order. Performs basic analysis using appropriate principles to solve problems. Selects and properly applies appropriate technology tools, but may need guidance. Demonstrates basic understanding of tools selected	Independently applies prerequisite engineering concepts to new problems. Selects correct engineering principles. Performs computations in a logical order. Correctly applies analytical tools or techniques and analyzes problem in depth. Clearly solves the problem. Independently selects and properly applies appropriate technology tools. Demonstrates thorough understanding of tools selected.
1d) Apply scientific principles that govern the performance of a given process or system in engineering problem(s).	Unable to apply prerequisite scientific concepts to new problems. Makes significant errors in computation and/or logic.	With extensive guidance, applies prerequisite scientific concepts to new problems. Computations may not include all important elements or steps. Order may not be logical.	Applies prerequisite scientific concepts to new problems, but may need some guidance. Correctly performs basic computations in a logical order.	Independently applies prerequisite scientific concepts to new problems. Selects correct scientific principles. Performs computations in a logical order.
1e) Apply math principles to obtain analytical or numerical solution(s) to an engineering problem.	Unable to apply prerequisite math concepts to new problems. Make significant errors in computation and or logic.	With extensive guidance, applies prerequisite math concepts to new problems. Computations may not include all important elements or steps. Order may not be logical.	Applies prerequisite math concepts to new problems, but may need some guidance. Correctly performs basic computations in a logical order.	Independently applies perquisite math concepts to new problems. Selects correct math principles. Performs correct, thorough, clear computations in logical order.

"NEW" EAC SLO 02: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

"OLD" EAC SLO c: Graduates will be able to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

Performance Criteria	(1) Limited or No Proficiency	(2) Some Proficiency	(3) Proficiency	(4) High Proficiency
2a) Identify an appropriate set of realistic constraints and performance criteria with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	No consideration of public health, safety or welfare. No consideration of any global, cultural, social, environmental or economic factors. A large number of codes, standards or performance criteria are missing or unclear.	Some consideration of public health, safety or welfare and/or global, cultural, social, environmental or economic factors. Is able to identify some codes & standards, but important elements are missing. Identifies & documents some performance criteria, but important elements are missing or unclear	Considers public health, safety or welfare and/or global, cultural, social, environmental or economic factors, but these considerations are limited or very basic. Presents basic relevant codes & standards. Identifies and documents performance criteria in a basic manner.	Prevents a multifaceted approach that fully considers the public health, safety and welfare as well as the global, cultural, social, environmental or economic factors. Thoroughly presents most important, relevant codes & standards applying to project. Clearly identifies & documents in-depth performance criteria.
2b) Create a detailed design/solution within realistic constraints.	Is unable to create a design or solution with sufficient detail or documentation. Does not address constraints.	Design or solution has some, but inadequate detail or documentation or does not address constraints.	Creates design or solution with adequate detail and documentation. Incorporates and addresses constraints.	Applies engineering principles to solution. Creates design with high level of detail and appropriate documentation. Thoroughly addresses constraints.
2c) Generate one or more creative solutions to meet the criteria and constraints.	Is unable to generate a creative, workable, usable, or realistic solution. Does not recognize constraints or identify criteria.	Generates a solution but does not demonstrate creativity or the ability to think through alternatives. Design may not be workable, useable or realistic. Misses important constraints or criteria.	Generates a basic solution demonstrating creativity in the design. Recognizes basic criteria and constraints.	Generates one or more workable, usable, or creative solutions. Demonstrates ability to see unique alternatives. Recognizes and addresses constraints thoroughly.
2d) Plan and	Does not develop a	Defines task and	Defines basic tasks	Defines realistic and

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manage a small technical project.	task/timeline, does not implement project with success, or does not provide documentation. Does not meet deadline.	timeline with some elements missing or unrealistic. Implements project but misses important elements. Documentation is provided but needs more detail. May not meet deadline.	and timelines, implements project, including testing and basic documentation, meets deadline.	detailed tasks and timelines, implements project in exemplary fashion, performs thorough testing, documents important procedures or processes in detail, completes plan on time.

"NEW" EAC SLO 03 An ability to communicate effectively with a range of audiences

"OLD" EAC SLO g: An ability to communicate effectively

Performance Criteria	(1) Limited or No Proficiency	(2) Some Proficiency	(3) Proficiency	(4) High Proficiency
3a) Purpose and Audience	• Purpose is unclear or requires substantial inference from the audience. • Intended audience is unclear or overly broad. • The work would not be meaningful or useful to the intended audience. • The work omits or dismisses key audience concerns.	• Purpose may be inferred, but is not clearly stated • Minor changes in approach or medium would make the work more meaningful or useful to the intended audience. • Some content is too advanced/basic for the intended audience.		• Content serves a specific, identifiable purpose (e.g., inform, persuade, analyze). • Purpose and content are appropriate to the needs of a specific, identifiable, and appropriate audience. • Content is tailored to the level of expertise, authority, and values of the audience. • Communication medium (essay, memo, report, speech, etc.) matches purpose and audience.
3b) Focus and Organization	• Organizing element is underdeveloped, inconsistent, or missing. • Order and structure are	• Organizing element is present, but needs development (it is too broad, narrow, or trivial). • Minor gaps in organization detract from the effectiveness of the work. • Minor changes in organization would clarify the hierarchy of claims and		• Content is focused on a specific and appropriate organizing element: a thesis statement,

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	unclear. • Digressions compromise or obscure the work's purpose. • Transitional elements are underdeveloped, inconsistent, or missing.	information. • Minor changes in transition language would improve the work (transitions between key ideas are choppy or abrupt).	purpose statement, or theme. • Content is organized so that ideas relate clearly to each other and to the organizing element. • Distinctions between major and minor claims are clear, providing consistent focus in content. • Transition language (and other organizing elements, such as headings or lists) throughout organizes ideas and guides audience understanding.
3c) Support and Documentation	• The work includes frequent instances of unsupported claims or key missing details. • The work relies on evidence that lacks rigor, based on the audience's or discipline's standards. • The work relies on demonstrably biased evidence (without providing appropriate context or qualification of that evidence). • The work treats sources with bias, or demonstrates incomplete understanding of source material.	• The work includes few instances of claims unsupported by appropriate evidence. • Additional or more carefully chosen details would improve the work. • The work includes (but does not rely on) evidence that lacks rigor, based on the audience's or discipline's standards. • Additional context or discussion of credentials for sources of evidence would add value to the work. • The work contains few, minor documentation errors (according to academic citation style or disciplinary approach).	• Claims are consistently supported with appropriate, relevant, and specific evidence, whether drawn from disciplinary knowledge, careful reasoning, or credible research. • Evidence derived from sources supports and develops original content. • Source material is credible; it is introduced and interpreted to provide context. • Source material is documented accurately according to the

	• The work does not meet academic citation or disciplinary standards.		appropriate conventions (academic citation style or disciplinary approach).
3d) Style and Conventions	• (Where students have a choice in form or medium) the choice or form or medium is inappropriate to audience, purpose, or context. • Terminology, word choice, sentence structure, or tone are not in keeping with professional or academic expectations for the work. • **Written**: prevalent or distracting spelling, grammar, syntax, usage, and/or mechanics errors compromise the work's impact, credibility, or coherence. • **Oral:** prevalent or distracting verbal and/or non-verbal delivery issues compromise the work's impact, credibility, or coherence.	• (Where students have a choice in form or medium) a minor change in form or medium would make the work more accessible or engaging to the audience. • Minor changes in terminology, word choice, sentence structure, or tone would improve the work. • **Written:** the work contains minor, isolated errors in spelling, grammar, syntax, usage, and/or mechanics; an editing pass would improve the work. • **Oral:** the work contains minor, isolated issues in verbal and/or non-verbal delivery; additional preparation or practice would improve the work.	• Students deliver content in spoken, written, or visual forms and media, as appropriate to context. • Use of language (terminology and word choice, sentence structure, etc.) is clear and professional, demonstrating mastery of content and form. • **Written:** students demonstrate correct grammar, spelling, syntax, usage, and mechanics. • **Oral:** both verbal and nonverbal delivery demonstrate poise, preparation, mastery of material and audience awareness/ engagement.
3e) Visual Communication (where appropriate)	• The work includes any visuals that are inappropriate to audience or context. • Necessary visuals are missing	• Minor changes in content, organization, or appearance would enhance the visuals in the work. • Additional or more carefully-chosen visuals would improve the work. • Some (but a minority of) visuals in the work serve a purely aesthetic purpose, and relate only tangentially to the	• High quality visuals are employed to illustrate, contribute to, or develop content, and not for purely aesthetic appeal.

	from the work. • Most (or all) visuals in the work serve a purely aesthetic purpose, and relate only tangentially to the work's purpose and content. • The work presents most (or all) visuals without context or interpretation. • The work presents most (or all) visuals without documentation (according to academic citation style or disciplinary approach).	work's purpose and content. • Additional context and interpretation of visuals would improve the work. • The work contains few, minor documentation errors of visuals, or the information presented in visual format (according to academic citation style or disciplinary approach).	• All visuals are appropriately introduced and interpreted. • All visuals are documented according to the appropriate conventions (academic citation style or disciplinary approach).
3f) Justification (Self- Assessment)	• Student omits discussion of multiple ESLO criteria. • Student's self-evaluation is cursory, facile, or is compromised by lack of insight (student overlooks obvious deficiencies in the work). • Student demonstrates an inability or unwillingness to elicit or use feedback to improve the work.	• Student omits evaluation of one ESLO criterion. • Student's self-evaluation would be improved by a more rigorous analysis. • Student's self-evaluation addresses only process, or only product, but does not address both. • A more rigorous approach to eliciting and using feedback would improve the work.	• Articulate a clear rationale for communication choices (purpose and audience, focus and organization, support and documentation, style and conventions, and visual communication). • Self-assess the quality of their work (including process and product). • Elicit and effectively use feedback to improve their work.

Communication rubric based on the OIT ESLO Communication rubric developed by the ESLO Communication Committee (approved by the Assessment Executive Committee, November 2016)

"NEW" EAC SLO 04: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

"OLD" EAC SLO f: An understanding of professional and ethical responsibility.
"OLD" EAC SLO h: The broad education necessary to understand the impact of engineering in a global, economic, environmental, and societal context.
"OLD" EAC SLO j: Graduates will have knowledge of contemporary issues.

Performance Criteria	(1) Limited or No Proficiency	(2) Some Proficiency	(3) Proficiency	(4) High Proficiency
4a) Demonstrates knowledge of the professional code of ethics and can use it to describe ethical issues. Demonstrates knowledge and understanding of "ethical diversity".	Identifies provisions in the professional code of ethics, but is unable to demonstrate importance or relevance to the profession. Has a vague idea of what the issues are but is uncertain how the code of ethics applies. Demonstrates none or minimal understanding of ethical diversity. Does not recognize biases.	Describes the importance of provisions, but some examples do not apply or fail to illustrate importance of the specified provision. Describes the issue(s) using concepts from code of ethics, but important elements may be missing or misunderstood. Demonstrates a partial understanding of ethical diversity and recognition of biases.	Describes the importance of the provisions in the professional code of ethics. Examples are applicable to the specified provisions and illustrate importance. Describes the issue(s) using basic concepts from the code of ethics. Demonstrates adequate understanding of ethical diversity and recognition of biases.	Describes in details the importance of provisions in the professional code of ethics and relevance to the profession. Examples are applicable to the specified provisions and illustrate importance. Describes the issue(s) in detail, demonstrating full understanding of relevant code of ethics provisions and how they relate to the issues(s). Demonstrates a complete understanding of ethical diversity and the recognition of biases.
4b) Understands the global impact of engineering decisions	Does not understand that engineering solutions have a global impact.	Realizes that engineering solutions have a global impact but had difficulty giving examples.	Understands engineering decisions have a global impact and can explain several examples.	Understands engineering decisions have a global impact, can analyze examples, and can reflect on impact of proposed engineering solutions.

4c) Understands the macro-economic impact of engineering solutions	Has little or no understanding of macro-economics.	Has little understanding of macro-economics and the effects of engineering solutions. Cannot give examples of such impacts.	Has some understanding of macro-economics and impacts on it from engineering solutions. Can give examples.	Has an understanding of macro-economics and the impact of engineering solution on it. Can explain examples and reflect on the impact new solutions may have.
4d) Understands major socio-economic and political issues of engineering solutions	Little or no understanding (or interest). Unable to put forth more than one side to an issue.	Moderate understanding of national and international issues. Can follow but has trouble expressing more than one side of an issue.	Good understanding of many issues. Understands and can express more than one side of an issue.	Deep understanding of the immediate and long-term implications. Articulate and expressive arguments from several viewpoints including the historical perspective.
4e) Understands the environmental and the social impact of engineering decisions	Does not believe that engineering decisions have a social or environmental impact.	Believe engineering solutions have a social and/or environmental impact but can't relate this to a particular situation.	Understands engineering decisions have social and/or environmental impacts. Can describe examples.	Understands engineering decisions have social and/or environmental impacts. Can relate this knowledge to a current situation.
4f) Describes and analyzes possible/alternative approaches and can explain the benefits and risks	Is unable to describe or analyze alternatives or consider the effect on parties involved. Has difficulty choosing an approach or stating benefits and risks.	Describes and analyzes only one alternative and its effect on parties involved, but important elements are missing or misunderstood. Chooses an approach and explains benefits and risks, but important elements are missing or misunderstood.	Describes and analyzes at least two alternatives and their effects on parties involved. Chooses an approach and explains basic benefits and risks.	Describes and analyze a number of alternative approaches and thoroughly considers the interests and concerns of all parties involved. Chooses an approach and thoughtfully and thoroughly explains benefits and risks.

"NEW" EAC SLO 05: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

"OLD" EAC SLO d: An ability to function on multidisciplinary teams.

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Performance Criteria	(1) Limited or No Proficiency	(2) Some Proficiency	(3) Proficiency	(4) High Proficiency
5a) Identifies and achieves goal/purpose	Clear goals are not formulated or documented. Members don't accept or understand the purpose/task of the group. Group does not achieve goal.	Individuals share some goals but a common purpose may be lacking. Priorities may be unrealistic and documentation may be incomplete. Group may not achieve goal.	Group shares common goals and purpose. Some priorities may be unrealistic or undocumented. Group achieves goal.	When appropriate, realistic, prioritized and measurable goals are agreed upon and documented and all team members share the common objectives/purpose. Team achieves goal.
5b) Assumes and fulfills roles and responsibilities as appropriate. Leadership strives to create a collaborative and inclusive environment.	Members do not fulfill roles and responsibilities. Leadership roles are not defined and/or shared. Members are not self-motivated and feel isolated. Assignments are not completed on time. Many members miss meetings.	Some members may not fulfill roles and responsibilities. Leadership roles are not clearly defined and/or effectively shared. Some members are not motivated and some assignments are not completed in a timely manner. Meetings rarely include most members.	Members often fulfil roles and responsibilities. Leadership roles are generally defined and/or shared. Generally, members are motivated and complete assignments in a timely manner. Many members attend most meetings.	Members consistently and effectively fulfill roles and responsibilities. Leadership roles are clearly defined and/or shared. Members move team goal by giving and seeking information or opinions and assessing ideas and arguments critically. Members are all self-motivated and complete assignments on time. Most members attend all meetings.
5c) Interacts and communicates effectively with team/group members.	Members do not communicate openly and respectfully. Members do not listen to each other. Communication patterns undermine teamwork.	Members may not consistently communicate openly and respectfully. Members may not listen to each other.	Members usually communicate openly and respectfully. Members often listen to most ideas. Members usually support and encourage each other.	Members always communicate openly and respectfully. Members listen to each other's ideas. Members support and encourage each other. Communication patterns foster a positive climate that motivates the team and builds cohesion and trust.
5e) Share appropriately	Contributions are unequal. Certain members dominate discussions, decision making, and work. Some	Contributions are unequal although all members contribute something to discussions,	Many members contribute to discussions, decision-making and work. Individuals focus on	All members contribute significantly to discussions, decision making and work. The work product is a collective effort: team

	members may not contribute at all. Individuals work on separate sections of the work product, but have no coordinating effort to tie parts together.	decision making and work. Coordination is sporadic so that the final work of product is uneven quality.	separate sections of the work product, but have a coordinator who ties the disparate parts together (they rely on the sum of each individual's work).	members have both individual and mutual accountability for the completion of the work product.
5f) Develop strategies for effective action	Members seldom use decision making processes to decide on action. Individuals often make decisions for the group. The group does not share common norms and expectations for the outcomes. Group fails to reach consensus on most decisions. Group does not produce plans for action.	Members sometimes use decision making processes to decide on action. Some of the members of the group do not share norms and expectations for outcomes. Group sometimes fails to each consensus. Plans for action are informal and often arbitrarily assigned.	Members usually use effective decision making processes to decide on action. Most of the group shares norms and expectations for outcomes. Group reaches consensus on most decision and produces plans for action.	Members use effective decision making processes to decide on action. Group shares a clear set of norms and expectations for outcomes. Group reaches consensus on decisions and produces detailed plans for action.
5g) Documentation and record keeping	No formal method or process for recording group decisions. Information is scattered and not accessible to group members.	An attempt has been made to keep records, but the format has missing elements and the documentation is incomplete or unclear.	A method or process exists for recording group decisions and results in understandable and usable documentation.	A method or process exists for recording group decisions which are shared and understood by all group members. Information about decisions is readily accessible and the final documentation is polished and organized.
5h) Cultural adaptation	Members do not recognize differences in background or communication style.	Members may recognize, but do not adapt to differences in background and communication style.	Members usually recognize and adapt to differences in background and communication style.	Members always recognize and adapt to differences in background and communication style.

"NEW" EAC SLO 6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

 "OLD" EAC SLO b: Graduates will have the ability to design and conduct experiments, as well as to analyze and interpret data.

Performance Criteria	(1) Limited or No Proficiency	(2) Some Proficiency	(3) Proficiency	(4) High Proficiency
6a) Ability to develop experiments	Has trouble identifying what parameters or physical phenomenon need to be measured	Can identify what physical parameters or phenomenon needs to be measured with some direction, but understanding of the reasons behind the choice are limited	Can identify what physical parameters or phenomenon that needs to be measured, but does not understand why.	Can identify what physical parameters or phenomenon needs to be measured. Understand the reasons behind the choices and can troubleshoot and provide alternative approaches as required.
6b) Ability to conduct experiments	Has trouble carrying out pre-defined experiments.	Able to conduct experiments with some direction.	Able to set up and carry through pre-defined experiments obtaining useful data.	Able to conduct experiments obtaining solid data appropriate to the investigation at hand.
6c) Ability to analyze and interpret data	Has difficulty analyzing experimental data. Presentation and reporting of results is confusing and hard to follow.	Able to analyze experimental data with general direction and guidance.	Ability to analyze experimental data. Can present and report results in an orderly and understandable manner.	Show ability to analyze experimental data independently extracting and presenting insightful results.
6d) Ability to use experimental judgement to draw conclusions	Has trouble applying experimental results as a basis for conclusions.	Able to use results as a basis for conclusions with significant guidance.	Can use results to support conclusions, but these conclusions are simplistic and limited.	Can use results to support detailed and insightful conclusions. Counter-arguments are examined and alternative hypotheses proposed.

"NEW" EAC SLO 07: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

"OLD" EAC SLO i: a recognition of the need for, and an ability to engage in life-long learning

Performance Criteria	(1) Limited or No Proficiency	(2) Some Proficiency	(3) Proficiency	(4) High Proficiency
7a) Lifelong learning	Fails to identify the need for "lifelong learning" and/or omits discussion of their own learning and relevant examples.	Misses important elements ins discussing "lifelong learning" applying concepts to their own learning or providing a relevant example.	Defines the concept of "lifelong learning". Demonstrates self-awareness by accurately identifying strengths/weaknesses in their own ability to learn independently. Gives a relevant example.	Defines the concept of "lifelong learning" and its importance. Demonstrates self-awareness by accurately discussing strengths/weaknesses in their own ability to learn independently. Gives relevant example(s).
7b) Learning strategies	Is not aware of any learning strategies. Learning is random and haphazard	Is aware of different learning strategies, but fails to apply these in a meaningful or purposeful way.	Is aware of different learning strategies and is able to utilize them.	Is aware of different learning strategies and actively works to utilize them to gain additional knowledge. Maintains currency of different learning methods and/or systems.
7c) Professional development	Fails to identify professional development opportunities.	Discusses professional development opportunities that are either inappropriate or irrelevant.	Identifies appropriate professional development opportunities.	Identifies and thoroughly discusses appropriate professional development opportunities.
7d) Short and long term career plans	Vaguely describes career goals and/or does not include a plan to meet them.	Career goals after graduation do not include both long and short term plans and/or the plan is unrealistic.	Describes short and long term career goals after graduation. Includes realistic plan to meet these goals.	Describes short and long term career goals after graduation. Includes realistic, thorough, and thoughtful plan to meet these goals.