

Institutional Effectiveness Report 2018-19

Program: Civil & Environmental Engineering BS

College and Department: College of Engineering – Civil Engineering

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Mission: The mission of the civil engineering program is to offer the strong academic content necessary to produce well-educated graduates who become innovative and productive members of society. Graduates will possess both the problem-solving skills and the fundamentals of critical thinking and analysis that are crucial for success within the framework of the civil and environmental engineering profession.

Program Goals

PEO 1. Graduates should demonstrate the ability for early career professional growth based on their grasp of fundamental concepts in civil engineering.

PEO 2. Graduates should utilize knowledge and skills to participate in civil engineering design and/or management processes.

PEO 3. Graduates should develop professionally through a commitment to life-long learning.

Student Learning Outcomes

Students should demonstrate...

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.

Attainment of PEO 1 is supported by Student Outcomes: 1,2,4,6

Attainment of PEO 2 is supported by Student Outcomes: 3,4,5

Attainment of PEO 3 is supported by Student Outcome: 7

Assessment Methods

1. *Course Components* are grades on a specific, recurring assignment or collection of assignments in a specific course. The assignment must be common to all faculty who teach the course.
2. *FE Exam* provides a measure of Civil Engineering content knowledge. The FE Exam topic area ratio scores provided to CEE by the National Council of Examiners for Engineering and Surveying. CEE requires all students to take the FE exam, so our scores are representative of all students.
3. *Final Course Grades* are accumulated across a graduating class. That is, the average grade in a specific course for all the students who graduated in a given term.
4. *Course Instructional Outcome Surveys and Senior Exit Surveys* are Likert scale survey questions. All have 4 answers: Strongly Disagree, Disagree, Agree, and Strongly Agree. CEE is experimenting with annual alumni surveys due to low response rates.

Expected Levels of Attainment: Because of scale differences between metrics, CEE has implemented color-coding to aid in the review process. The color coding and the criteria used in its application are found below:

SO Attainment Color Coding Criteria

Color Code			
Attainment Level	Unacceptable	Acceptable	Excellent
Metric	Criteria		
Course Components (Out of 100)	Average < 70	Average ≥ 70	Average ≥ 80
FE Exam Ratio Scores (CEE Performance Index / Comparator)	Ratio Score < 0.80	Ratio Score ≥ 0.80	Ratio Score ≥ 0.90
Final Course Grades (4-Point Grading Scale)	Average < 2.50	Average ≥ 2.50	Average ≥ 2.75
Course Instructional Outcome Surveys (Out of 4)	Average < 2.50	Average ≥ 2.50	Average ≥ 2.75
Senior Exit Surveys (Out of 4)	Average < 2.50	Average ≥ 2.50	Average ≥ 2.75

The faculty chose to include multiple metrics for each SLO. Multiple metrics help the faculty to avoid unneeded reactions to statistical outliers that occur during any evaluation. As such, the occurrence of a single Low or Unsatisfactory rating will not necessarily require a response.

The thresholds for a required response are:

- Multiple metrics in the red in a single academic year for a given outcome
- Single metrics in the red in consecutive academic years for a given outcome
- Multiple metrics that remain “in the yellow” (i.e., satisfactory) in multiple academic years for a given outcome. Yellow followed by red and vice versa are considered multiple “satisfactory” years as well as single years in the red.

In addition to these required responses, there are three additional ways in which responses may be initiated. During their reviews of the metrics, the Chair, the Faculty, or the Advisory Board can request action or further investigation even if all the metrics are Excellent. This flexibility allows the opportunity to begin investigations before they are required, hopefully reducing our response time in applying improvements. It also allows for improvements even when there are no issues.

Annual Schedule for Continuous Improvement

A new annual continuous improvement review schedule was proposed and introduced in Fall 2014. This new schedule leverages our existing year-round continuous improvement process and adds program-level reviews to that calendar. As noted above, this portion of the continuous improvement process continued despite the change-of-leadership issues, which affected a previous mid-cycle review.

Reminders of the new schedule will be integrated into the typical meeting agendas so that any future changes in departmental leadership should not result in lapses. There are two key events in the new schedule that will provide for program-level assessment, the CEE Fall Faculty Retreat and the CEE Fall Advisory Board Meeting. At each of these meetings, the CEE Chair presents all data from the prior academic year for review. If data indicate a need for programmatic review or action, or if the faculty or the Advisory Board wish to initiate a response where none is required, the CEE ABET committee will be notified of the need to initiate appropriate investigations and provide recommendations for improvement to the CEE faculty and/or the Advisory Board at the beginning of the Spring semester, if possible.

While the actual process is continuous, its components are presented herein based on the academic calendar, i.e., starting in August. In August, the CEE Faculty Fall Retreat includes a faculty review of all Student Outcome metrics plus any supplemental information deemed significant by the chair. This allows the faculty to determine if any required or desired actions are needed and to then assign such tasks to the ABET Committee. The faculty also review our Program Educational Objectives and departmental Vision and/or Mission statements to ensure they remain current. This meeting includes discussion of recent implementations from past reviews and continuing discussion of new actions under consideration as needed.

In October/November, the Advisory Board reviews Student Outcome metrics to add their insight and requests for investigation to those of the faculty. They also review any planned or recently implemented program changes.

The ABET Committee meets as needed through the fall semester to address any assigned tasks.

In March/April, the CEE Chair reviews Fall (July-December) FE Exam results. The Advisory Board also reviews both Program Educational Objectives and departmental Mission/Vision statements to give input for the upcoming Fall Faculty Retreat.

In June/July, Spring FE Results are typically received and staff tabulate all Student Outcome metrics from the prior academic year. These metrics are then reviewed by the Chair in preparation for the Fall Faculty Retreat, at which point the cycle begins again.

This schedule provides for annual opportunities to identify and react to both course-level and program-level issues as they become apparent. Thus, in addition to helping reduce dependence on a large-scale mid-cycle and end-of-cycle review, the new schedule allows for faster response to program-level issues.

Results:

SO 1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

In order to capture all parts of an engineering problem (and identify any potential issues) as indicated in SO1, the outcome was broken up into three parts:

1. "Identify" – the CEE 4950 Interim 1 Technical Report grade was used as it would be expected that students have successfully identified the engineering problem
2. "Formulate" – the CEE 4950 Interim 2 Technical Report grade was used as, at this point, students would have devised a methodology for solving the engineering problem
3. "Solve" – the CEE 4950 Final Report grade should give an indication regarding the students' ability to solve the engineering problem

All metrics for this outcome are shown in the table below:

ABET 1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

	2014-15		2015-16		2016-17		2017-18		2018-19	
	Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr
CEE 4950 Senior Design Course Components										
Mentor (Technical) Grade on Interim Report 1 - Identify		85.0		81.0	86.8	84.1	86.8	86.6	83.4	81.6
Mentor (Technical) Grade on Interim Report 2 - Formulate		83.0		83.3	88.7	86.0	88.6	88.0	91.7	85.6
Mentor (Technical) Grade on Final Report - Solve	88.8	89.0	88.6	86.0	76.4	87.0	90.2	89.6	93.5	88.5
Senior Exit Surveys										
Survey question - (1a) Identify										3.64
Survey question - (1b) Formulate										3.54
Survey question - (1c) Solve										3.62
Survey Question - Combined							3.74	3.55	3.57	
FE Exam Ratio Scores										
Engineering Mechanics (Statics)	0.92	0.98	0.91	0.80	0.83	0.97	1.10	0.98	0.98	0.95
Environmental Engineering	1.00	1.05	0.94	1.02	0.92	0.93	1.80	1.00	1.02	1.07
Soil Mechanics & Foundations (Geotechnical)	0.90	1.00	0.87	0.85	0.92	0.96	0.99	0.98	0.96	1.13
Hydraulics & Hydrologic Systems	0.93	1.03	1.01	0.93	0.95	0.98	0.99	0.96	1.01	0.93
Transportation Engineering	0.99	1.09	1.02	1.08	0.89	1.03	1.02	1.07	1.08	1.04
Structural Analysis	0.83	1.00	0.95	0.90	0.87	0.99	1.10	1.02	1.01	1.02
Structural Design	0.99	1.02	0.96	0.99	1.01	1.07	1.11	0.99	1.07	1.00
Materials	1.07	1.13	0.86	1.01	1.01	1.04	0.91	1.03	0.97	0.96
Final Course Grades										
CEE 2110 Statics	2.56	2.58	2.61	2.13	2.93	2.96	2.95	3.31	3.07	3.33
CEE 3020 Surveying	3.25	3.40	3.11	2.95	3.20	3.30	2.91	3.45	3.33	3.46
CEE 3413 Environmental Engineering	2.90	3.00	2.68	2.85	2.75	2.96	2.86	3.17	2.89	3.23
CEE 4310 Steel Design	2.85	2.96	2.80	2.95	3.27	3.00	2.91	3.15	2.39	2.15
CEE 4320 Concrete Design	2.85	2.73	2.84	2.55	2.44	2.64	2.10	2.72	2.50	2.15
CEE 4630 Traffic Engineering	3.20	3.33	2.57	3.00	3.00	2.75	3.60	3.17	2.67	3.33
CEE 4800 Geotechnical Engineering	2.65	3.12	3.20	2.70	3.00	2.81	3.09	2.97	2.72	2.77
ENGR 1110 Engineering Graphics	3.19	3.52	3.31	2.63	3.17	3.15	3.19	3.27	3.25	3.23
ENGR 1120 Programming	2.87	3.00	2.59	2.71	2.67	2.84	2.81	2.89	2.61	3.42
Course Instructional Outcome Surveys										
CEE 2110 Statics	3.45	3.29	2.70		3.18	3.73	3.46	3.52	3.57	3.28
CEE 3413 Environmental Engineering		3.11	3.49	3.49	3.59	3.24	3.47	2.70	3.33	3.35
CEE 4800 Geotechnical Engineering	3.04		3.65	3.64	3.67	3.52	3.84	3.80	3.67	3.72
CEE 4950 Senior Design		3.78	3.77	3.80	3.60	3.77	3.54	3.88	3.40	3.69
CEE 3020 Surveying	3.60		3.39		3.51	3.61	3.52	3.45	3.57	3.49
CEE 4310 Steel Design	3.33	3.58	3.06	3.83	3.66	3.76	3.75	3.52	3.66	3.68
CEE 4320 Concrete Design	3.75	2.60	2.69	3.60	3.68	3.78	3.67	3.54	2.34	3.07
CEE 4630 Traffic Engineering			3.22		3.01		3.82		3.32	

Based on the thresholds for a required response, there are apparent issues with CEE 4310 Steel Design and 4320 Concrete Design final course grades as both metrics have multiple reds for the given academic year. Two structural faculty who taught those courses departed CEE in 2016-17, with a one-year gap before new adjunct/faculty arrived. Recent faculty hires and time for those new hires to acclimate should reverse the trend. We will monitor progress for the next year to see if further actions are required.

SLO 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

All metrics for this outcome are shown in the table below:

		2014-15		2015-16		2016-17		2017-18		2018-19	
		Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr
ABET 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											
CEE 4950 Senior Design Course Components											
	Mentor (Technical) Grade on Final Report - Solve	88.8	89.0	88.6	86.0	76.4	87.0	90.2	89.2	93.5	86.0
Senior Exit Surveys											
	Single survey question covers "Apply engineering design"										3.50
	Single survey question covers "consideration of..."										3.50
	Single survey question covers "...factors"										3.31
Average Grades on Course Components											
	CEE 4380 Bridge Design Project	84.7		90.6		87.6					
	CEE 4640 Highway Design Project*					80.3		86.1			
	CEE 4950 Senior Design Project Technical	88.8	89.0	88.6	86.0	76.4	87.0	90.2	89.6	93.5	88.5
Final Course Grades											
	CEE 3020 Surveying	3.71	3.69	3.18	3.42	3.40	3.47	3.63	3.21	3.57	3.30
	CEE 4310 Steel Design	2.85	2.96	2.80	2.95	3.27	3.00	2.91	3.15	2.39	2.15
	CEE 4320 Concrete Design	2.85	2.73	2.84	2.55	2.44	2.64	2.10	2.72	2.50	2.15
	CEE 4630 Traffic Engineering	3.20	3.33	2.57	3.00	3.00	2.75	3.60	3.17	2.67	3.33
	ENGR 1110 Engineering Graphics	3.19	3.52	3.31	2.63	3.17	3.15	3.19	3.27	3.25	3.23
	ENGR 1120 Programming	2.87	3.00	2.59	2.71	2.67	2.84	2.81	2.89	2.61	3.42
Course Instructional Outcome Surveys											
	CEE 4380 Bridge Design	3.74		3.63		3.65		3.68		3.69	
	CEE 4640 Highway Design				3.88		3.16		3.70		
	CEE 4950 Senior Design		3.78	3.77	3.80	3.60	3.77	2.68	3.89	3.40	3.69
	CEE 3020 Surveying	3.60		3.39		3.51	3.61	3.52	3.37	3.57	3.49
	CEE 4310 Steel Design	3.33	3.58	3.06	3.83	3.66	3.76	3.75	3.52	3.66	3.68
	CEE 4320 Concrete Design	3.75	2.60	2.69	3.60	3.68	3.78	3.69	3.54	2.34	3.07
	CEE 4630 Traffic Engineering			3.22		3.01		3.82		3.32	
* This course is typically offered only during spring semesters. First, data were not tabulated prior to spring 2017. Second, the course was not offered in 2019 due to faculty medical											

Based on the thresholds for a required response, we see as we did in SO 1 the issues with CEE 4310 Steel Design and 4320 Concrete Design final course grades as both metrics has multiple reds for the given academic year. As referenced in SO 1, two structural faculty who taught those courses departed CEE in 2016-17, with a one-year gap before new adjunct/faculty arrived. Recent faculty hires and time for those new hires to acclimate should reverse the trend. We will monitor progress for the next year to see if further actions are required.

SO 3. An ability to communicate effectively with a range of audiences

Communication skills are assessed separately for both oral and written in CEE 4950. Written communication skills are directly measured for both the technical report and poster presentation. The oral presentation component has been separated out as “Presentation Skills”. The “Quality of Slides” component functions as a measure of both written and oral communication skills.

All metrics for this outcome are shown in the table below:

ABET 3. an ability to communicate effectively with a range of audiences [G]											
		2014-15		2015-16		2016-17		2017-18		2018-19	
		Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr
CEE 4950 Senior Design Course Components											
	CEE 4950 Senior Design - Written Report (Technical Writing)	83.7	85.0	81.4	83.0	74.8	86.0	80.1	87.4	86.5	84.4
	CEE 4950 Senior Design - Oral Presentation (Presentation Skills)					89.9		93.0		90.0	
	CEE 4950 Senior Design - Oral Presentation (Quality of Slides)					91.9		93.8		89.3	
	CEE 4950 Senior Design - Poster Presentation		91.4		91.0	92.4	88.2	93.2	90.2	91.6	90.7
Senior Exit Surveys											
	Single survey question covers (3) - Writing										3.35
	Single survey question covers (3) - Oral										3.29
Course Instructional Outcome Surveys											
	CEE 4950 Senior Design - Oral Communication		3.78	3.82	3.72	3.70	3.81	3.69	3.90	3.38	3.82
	CEE 4950 Senior Design - Written Communication		3.78	3.82	3.90	3.43	3.78	3.61	3.90	2.88	3.59
Final Course Grades											
	PC 2500 - Oral Communication	4.00	3.67	4.00	3.86	4.00	3.82	4.00	4.00	4.00	4.00
	SPCH 2410 - Oral Communication	4.00	2.73	3.50	3.20	3.20	3.14	2.89	3.23	3.00	3.50

There are no metrics in red and only one metric in yellow for the current year with no past trend of yellow. Hence no response is currently required. Students continue to perform at a high level indicating excellent performance.

SO 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

The CEE 4920 Professionalism and Ethics course final grade is the primary metric for this SO. New questions on the senior exit survey provide a new metric for this SO.

All metrics for this outcome are shown in the table below:

ABET 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											
		2014-15		2015-16		2016-17		2017-18		2018-19	
		Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr
FE Exam Ratio Scores											
	Ethics & Business Practices	0.94	1.03	1.06	0.96	0.81	1.01	1.01	0.96	1.01	1.06
Instructional Outcome Survey Question(s)											
	CEE 4920 Professionalism and Ethics	3.81	3.64	3.77	3.71	3.67	3.74	3.79	3.62	3.62	3.79
Senior Exit Surveys											
	Single survey question covers "ethical and professional responsibilities..."										3.57
	Single survey question covers "make informed judgments..."										3.50
Final Course Grades											
	CEE 4920 Professionalism and Ethics	3.90	3.69	3.95	4.00	3.88	3.92	3.68	3.90	3.61	3.69
Course Instructional Outcome Surveys											
	CEE 4950 Senior Design		3.78	3.77	3.80	3.60	3.77	3.54	3.88	3.40	3.69

There are no metrics in red or yellow for the 2018-2019. Hence no response is currently required. Students continue to perform at a high level of performance on all metrics including the new survey questions.

SO 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

SO 5 is broken into three parts for assessment.

1. "an ability to function effectively on a team whose members together provide leadership..." – CEE 4950 Senior Design focuses on leadership.
2. "...create a collaborative and inclusive environment..." – Peer evaluations are a part of our CEE 4950 Senior Design grading scheme. Students directly assess each other regarding their group.
3. "...establish goals, plan tasks, and meet objectives..." – Students are assessed on management principles in CEE 4950 Senior Design, which will continue under the new student outcomes.

ABET 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 [D]		2014-15		2015-16		2016-17		2017-18		2018-19	
		Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr
CEE 4950 Senior Design Course Components											
	CEE 4950 Senior Design - Leadership paper		85.0		82.0	73.6	85.0	79.7	77.0	92.6	75.0
	CEE 4950 Senior Design - Management paper		91.0		75.0	72.8	91.0	85.7	79.0	77.0	88.0
	CEE 4950 Senior Design Project (Peer Eval)	87.5	97.0	87.4	88.0	88.0	91.0	77.3	92.0	81.6	95.0
Instructional Outcome Survey Question(s)											
	CEE 4950 Senior Design ⁴		3.78	3.77	3.80	3.60	3.77	3.54	3.88	3.40	3.69
Senior Exit Surveys											
	Single survey question covers leadership										3.36
	Single survey question covers collaborative and inclusive environment										3.46
	Single survey question covers "establish goals, plan tasks, and meet objectives"										3.50

While two metrics appear in yellow, these metrics have not remained in yellow for multiple academic years. However, faculty are considering additional elements to support student progress on the Management Paper.

SO 6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

ABET 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions											
		2014-15		2015-16		2016-17		2017-18		2018-19	
		Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr
Senior Exit Surveys											
	Single survey question covers "develop and conduct"										3.14
	Single survey question covers "analyze and interpret"										3.50
	Single survey question covers "draw conclusions"										3.21
Average Grades on Course Components											
	CEE 3030 Civil Engineering Materials	92.2	87.2	88.0	86.5	90.4	81.7	81.8	84.3	86.9	91.8
Final Course Grades											
	CEE 3020 Surveying	3.25	3.40	3.11	2.95	3.20	3.30	2.91	3.45	3.33	3.46
	CEE 3040 Geotechnical Engineering Lab	3.17	3.71	3.33	3.13	2.88	3.29	3.10	3.00	2.40	3.00
	CEE 3120 Mechanics of Materials Lab	3.71	3.69	3.18	3.42	3.40	3.47	3.63	3.21	3.57	3.30
	CEE 3430 Environmental Engineering Lab	4.00	4.00	3.93	3.45	2.71	3.00	3.22	3.50	3.65	3.69
	ENGR 1110 Engineering Graphics	3.19	3.52	3.31	2.63	3.17	3.15	3.19	3.27	3.25	3.23
	ENGR 1120 Programming	2.87	3.00	2.59	2.71	2.67	2.84	2.81	2.89	2.61	3.42
Course Instructional Outcome Surveys											
	CEE 3020 Surveying	3.60		3.39		3.51	3.61	3.52	3.45	3.57	3.49
	CEE 3030 Civil Engineering Materials	3.09	3.03	3.23	2.67	3.51	3.16	3.27	3.47	2.69	3.37
	CEE 3040 Geotechnical Engineering Lab	3.54	3.71	3.18	3.62	3.66	3.58	3.68	3.70	3.61	3.67
	CEE 3120 Mechanics of Materials Lab	3.68	3.41	3.66	3.58	3.58	3.44	3.42	3.45		3.14
	CEE 3430 Environmental Engineering Lab	3.74	3.50	3.61	3.74	3.84	3.52	3.91	3.66		3.73

While the Geotechnical Engr lab report fell into the unacceptable threshold for a semester, there is no trend of consecutive years of red. As a single occurrence, no actions are currently warranted. Students continue to perform well on all other metrics.

SO 7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

ABET 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies [1]											
		2014-15		2015-16		2016-17		2017-18		2018-19	
		Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr	Fall	Spr
CEE 4950 Senior Design Course Components											
	CEE 4950 Mentor final technical grade - "Acquire and Apply"	88.8	89.0	88.6	86.0	76.4	87.0	90.2	89.6	93.5	88.5
Senior Exit Surveys											
	Single survey question covers "acquire"										3.64
	Single survey question covers "apply"										3.64
FE Exam Ratio Scores											
	Overall FE Exam Pass Rate	0.77	1.07	0.66	0.58	0.42	0.84	1.01	0.90	1.00	0.94

The Overall FE Exam pass rate continues to improve since moving CEE 4940 FE Review from the last semester to the penultimate semester and reformatting the course from an independent study to an in-person review class. The in-person review class seems to have had a large impact on the pass rate.

All other metrics including the new Senior Exit Survey questions indicate an excellent level of process for students.

Modifications for Improvement:*SO 1 and SO 2*

CEE 4310 Steel Design and 4320 Concrete Design final course grades had multiple reds for the current academic year. As noted previously, two structural faculty who taught those courses departed CEE in 2016-17, with a one-year gap before new adjunct/faculty arrived. Recent faculty hires and time for those new hires to acclimate should reverse the trend. We will monitor progress for the next year to see if further actions are required.

SO 5

While two metrics appear in yellow, these metrics have not remained in yellow for multiple academic years. However, faculty are considering additional elements to support student progress on the Management Paper.

Appendices

1. Curriculum Map