Academic year 2024-2025

BS in Civil Engineering - BS-CVEN Learning Outcomes

An ability to identify, formulate & solve complex engineering problems

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

1.1 Identify the type of complex engineering problem
1.2 Develop and formulate a solution methodology to solve a complex engineering problem by applying scientific, engineering, and mathematical principles
1.3 Solve complex engineering problems

MEASURES	RESULTS	ACTIONS
Assessment of Outcome 1 via CVEN 3370 Water and Waste Water Treatment Though not formally evaluated yet, new actions were implemented in Spring 2025 to improve teaching effectiveness. Please see the action described below. *Water & Wastewater Treatment: CVEN 3370* **Target** CVEN 3370 Water and Waste Water Treatment will used to evaluate Outcome 1 in Spring 2026.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2026, and no data is collected from this course yet.	**Modify Policies / Procedures** COMPLETE In Spring 2025, added additional quizzes and in-class examples to improve the overall understanding of Environmental Engineering fundamental concepts. As result, 3 at-risk students cleared the class with higher grades. Recommended Due Date: 05/06/2025
Assessment of Outcome 1 via CVEN 4365 Introduction to Transportation Engineering Though not formally evaluated yet, some actions were implemented to improve the teaching effectiveness in Fall 2024. *Intro to Transportation Engr: CVEN 4365* **Target** CVEN 4365 Introduction to Transportation Engineering will be used to evaluate Outcome 1 in Fall 2026.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Fall 2026, and no data is collected from this course yet.	**Revise Measurement / Assessment** COMPLETE 1) Survey among students to collect the needs, concern, and expectation of students after Test 1; 2) Videos were made for students to use VISSIM for course project, and 3) the solutions of all examples discussed in the class were uploaded to the Blackboard. Results: The class did pretty well in Test 2 and in the course project. Recommended Due Date: 12/13/2024
Assessment of Outcome 1 via CVEN 4350 Hydraulic Engineering Though not formally evaluated yet, in Spring 2025, some actions were implemented to improve teaching effectiveness. *Hydraulic Engineering: CVEN 4350* **Target** CVEN 4350 Hydraulic Engineering will be used to assess Outcome 1 in Spring 2027.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2027, and no data is collected from this course yet.	**Revise Measurement / Assessment** COMPLETE 1) Lecture videos uploaded for students to watch before the class, 2) Flipped classroom teaching method is implemented 3) 15 in-class quizzes were given in a manner assuming the students have online lecture prior to coming to class. Results: Students started asking more questions in the class, however, most of them think this method requires more time than original class and only watch the video whenever they have

		time. I have to give the quiz after the lecture after the first exam.
Assessment of Outcome 1 via CVEN 3300 Engineering Materials Systems Though not formally evaluated yet in Spring 2025. some actions were implemented to improve the teaching effectiveness. *Engineering Materials Systems: CVEN 3300* **Target** CVEN 3300 Engineering Materials Systems will be used to assess Outcome 1 in Spring 2027.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2027, and no data is collected from this course yet.	**Revise Measurement / Assessment** COMPLETE (1) Introduced a structural engineering term project that included the design of a MWFRS and purlin using ASCE 7-16 and NDS. (2) Students created a 3D timber frame model, used ASCE 7 to calculate dead, roof live, and wind load using the directional method. (3) Students used STAADPro to create the 3D model which leveraged wind definitions features for the windward and leeward walls, and used the auto combination feature within STAADPro to complete the analysis. (4) Students then used NDS to determine the capacity of the MWFRS elements under combined bending and axial force. Results: Students completed their two technical memos and final oral presentation successfully. Students learned how to model in 3D and using advanced features in STAADPro. Recommended Due Date: 05/06/2025

An ability to apply engineering design

An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as wells as global, cultural, social, environmental, and economic factors.

2.1 Engineering design solution meets specified technical standard/code/manual requirements.
2.2 Engineering design solution considers and satisfies specified public health, safety, or welfare needs and constraints.
2.3 Engineering design solution considers and satisfies specified global, cultural, social, environmental, or economic needs .

MEASURES	RESULTS	ACTIONS
Assessment of Outcome 2 via CVEN 4380 Reinforced Concrete Design *Reinforced Concrete Design: CVEN 4380* **Target** CVEN 4380 Reinforced Concrete Design will be employed to assess Outcome 2 in Fall 2025.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Fall 2025, and no data is collected from this course yet.	*No actions have been added.*
Assessment of Outcome 2 via CVEN 4313 Civil Engineering System Design Project (II) *Civil Eng Sys Des Proj (II): CVEN 4313* **Target**	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2026, and no data is collected from this course yet.	**Revise Measurement / Assessment** COMPLETE (1) Improved project deliverables by requiring CAD drawing sets--including grading plans, utilities, and SWPPP. (2) Included one additional site visit in the spring semester, and added one guest lecture on estimating and scheduling.

CVEN 4313 Civil Engineering System Design Project (II) will be used to assess Outcome 2 in Spring 2026. Though not formally evaluated yet, some actions were implemented to improve teaching effectiveness in Spring 2025.		(3) Added a construction phasing deliverable. Results: Students started asking more questions in the class, however, most of them think this method requires more time than original class and only watch the video whenever they have time. I have to give the quiz after the lecture after the first exam. Recommended Due Date: 05/06/2025
Assessment of Outcome 2 via CVEN 3370 Water and Waste Water Treatment Though not formally evaluated yet, in Spring 2025, some actions were implemented to improve the teaching effectiveness. *Water & Wastewater Treatment: CVEN 3370* **Target** CVEN 3370 Water and Waste Water Treatment will be employed to assess Outcome 2 in Fall 2025.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Fall 2025, and no data is collected from this course yet. **Analysis** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Fall 2025, and no data is collected from this course yet.	**Revise Measurement / Assessment** COMPLETE Added additional quizzes and in-class examples to improve the overall understanding of Environmental Engineering fundamental concepts. Results: 3 at-risk students cleared the class with higher grades Recommended Due Date: 05/06/2025

An ability to communicate effectively with a range of audiences

An ability to communicate effectively with a range of audiences.

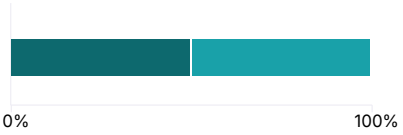
3.1 Ability to communicate orally to a wide range of audiences.
3.2 Ability to communicate in written form.
3.3 Ability to communicate technical drawings, schematic, figures, and tables to a wide range of audiences.

MEASURES	RESULTS	ACTIONS
Assessment of Outcome 3 via CVEN 4313 Civil Engineering System Design Project (II) This course is not evaluated for Outcome 3 yet during the period of 2024-2025 yet. Instead, this course was used to evaluate Outcomes 4 and 5. Some actions were implemented in Spring 2025 to improve the teaching effectiveness. *Civil Eng Sys Des Proj (II): CVEN 4313* **Target** CVEN 4313 Civil Engineering System Design Project (II) will be employed to assess Outcome 3 in Spring 2026.	**Analysis** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2026, and no data is collected from this course yet.	**Revise Measurement / Assessment** COMPLETE 1. Improved project deliverables by requiring CAD drawing sets--including grading plans, utilities, and SWPPP. 2. Included one additional site visit in the spring semester, and added one guest lecture on estimating and scheduling. 3. Added a construction phasing deliverable. Results: Successful. Each group delivered adequate drawing sets with acceptable level of detail. Recommended Due Date: 12/13/2024

An ability to recognize ethical and professional responsibilities MET

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 social contexts.

4.1 Recognize ethical responsibilities in engineering situations.
4.2 Recognize professional responsibilities in engineering situations.
4.3 Make informed judgments considering impact of engineering solutions.

MEASURES	RESULTS	ACTIONS
Evaluation of Outcome 4 through CVEN 4110 based on Students' Case Studies In CVEN 4110, students were given a wide range of case studies to discuss and comment. The students were expected to use the National Society of Professional Engineers (NSPE) Code of Ethics to recognize ethical and professional responsibilities in these engineer Case Studies 1, 6, and 8 from 16 students in CVEN 4110 were used to evaluate the following two **performance indicators**, respectively. • 4.1: Recognize ethical responsibilities in engineering situations, • 4.2: Recognize professional responsibilities in engineering situations. Direct - Assignment *Seminar: CVEN 4110* **Target** Two performance indicators were used for assessment: 4.1) Recognize ethical responsibilities in engineering situations, 4.2) Recognize professional responsibilities in engineering situations. 70% students are expected to achieve the targeted threshold performance of 3.0 or higher. Fall 2024_Case Studies.pdf	MET Evaluation of Outcome 4 through CVEN 4110 based on Students' Case Studies Exceeded Met  0% 100% *Values are not shown when too close to each other. Click or use arrow keys to see details.* **Exceeded:** 50% **Met:** 50% **Met Total:** 100% **Not Met Total:** **Analysis** There were totally 16 students for assessment. The following criteria were used for the evaluation: • >= 3.5 Exceeded • >=3, < 3.5: Met • >=2/5, < 3: Approached • <2.5: Not Met It shows that under both performance indicators, we have • Exceeded: 8 students for both Performance Indicators 4.1 and 4.2 • Met: 8 students for Performance Indicators 4.1 and 4.2 Therefore, from the data collected, we can see that Objective 4 was well met. The students were able to recognize ethical and professional responsibilities.	**Maintain Assessment Strategy** Since the results are good. No additional action plan is needed. No further evaluation of outcome 4 is needed until the next evaluation cycle. We will maintain the assessment strategy.
Assessment of Outcome 4 via CVEN 4313 Civil Engineering System Design Project (II) The assessment was completed using rubric (likert scale 1-4) and the performance indicator 4.3 was assessed using the assignments described below. **Performance Indicator 4.3: make informed judgments considering impact of engineering solutions.** The Senior Capstone Final Report Reflection Essay was used as the direct measurement to	MET Assessment of Outcome 4 via CVEN 4313 Civil Engineering System Design Project (II) Exceeded Met  0% 100% *Values are not shown when too close to each other. Click or use arrow keys to see details.* **Exceeded:** 75%	**Revise Measurement / Assessment** COMPLETE Improved project deliverables by requiring CAD drawing sets--including grading plans, utilities, and SWPPP. Included one additional site visit in the spring semester, and added one guest lecture on estimating and scheduling. Added a construction phasing deliverable. Recommended Due Date: 04/25/2025

assess Performance Indicator 4.3. As part of the final design report, students were tasked with discussing their design process and how they integrated broader environmental, societal, and global impacts. The students were asked how they considered these broader issues within their decision-making process. Every student in the course was assessed. The student outcome shall be attained if greater than or equal to **70%** of the entire student population receives an average score of **3 out of 4**. The final aggregated score is the average of all assessed assignments. Each assessed assignment is weighted equally. Then, an average score was computed for every student in the assessed course. An average score of 3/4 indicates a student has an "accomplished" performance. The following attached are the Final Reports from 4 groups. These reports were used for assessment. Direct - Other *Civil Eng Sys Des Proj (II): CVEN 4313* **Target** Every student (12 students in total) in the course was assessed for Performance Indicator 4.3. The student outcome shall be attained if greater than or equal to 70% of the entire student population receives an average score of 3 out of 4. Performance Indicator 4.3: make informed judgments considering impact of engineering solutions. CVEN4313_FinalReport_1.pdf CVEN4313_FinalReport_2.pdf CVEN4313_FinalReport_3.pdf CVEN4313_FinalReport_3_additional.pdf CVEN4313_FinalReport_4.pdf	**Met:** 25% **Met Total:** 100% **Not Met Total:** **Analysis** There were totally 12 students for assessment under Performance Indicator 4.3, using the following criterion: • >= 3.5 Exceeded • >=3, < 3.5: Met • >=2/5, < 3: Approached • <2.5: Not Met The Senior Capstone Final Report Reflection Essay was used as the direct measurement to assess Performance Indicator 4.3. The student outcome shall be attained if greater than or equal to **70%** of the entire student population receives an average score of **3 out of 4**. We have the following assessment results: • Exceeded: 9 students • Met: 3 students • Approached: 0 student • Not Met: 0 student Therefore, it indicates that Performance Indicator 4.3 was well met based on the data collected from CVEN 4313. The students were able to make informed judgments considering impact of engineering solutions.	

Conclusion

Based on the assessment based on CVEN 4110 and CVEN 4313, Outcome 4 was well met.

An ability to function effectively on a team MET

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.

5.1 Members provide leadership and create a collaborative and inclusive environment.
5.2 Members establish goals, plan tasks, and meet objectives.

MEASURES	RESULTS	ACTIONS

Assessment of Outcome 5 based on CVEN 1201 via Peer Evaluation and Presentation

The freshmen students (CVEN1201) were requested to design a coffee mug tree stand made from plastic to meet specific design specifications and constraints. For the design, the students are expected to use Fusion 360 (3-D modeling software). At the end of the project, the freshmen will be requested to present their work in a class setting and be evaluated. This task was designed to evaluate the students' ability to function effectively on a team and create a collaborative environment.

The assessment uses two performance indicators:

- 5.1) Members provide leadership and create a collaborative and inclusive environment,
- 5.2) Members establish goals, plan tasks, and meet objectives.

Direct - Presentation

Intro to Civil Engineering: CVEN 1201

Target

The student shall be able to 5.1) Members provide leadership and create a collaborative and inclusive environment, 5.2) Members establish goals, plan tasks, and meet objectives.

70% of the students will achieve the targeted threshold performance of 3.0 or higher.

Group 1.pptx

Group 2.pptx

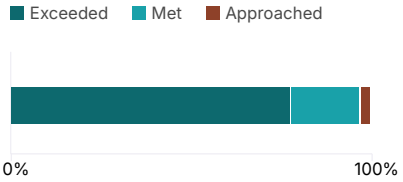
Group 3.pptx

Group 4.pptx

Peer Evaluations.pdf

MET

Assessment of Outcome 5 based on CVEN 1201 via Peer Evaluation and Presentation



Exceeded:	77%
Met:	19%
Approached:	3%
Met Total:	97%
Not Met Total:	3%

Analysis

There were totally 31 students for assessment under Performance Indicators 5.1 and 5.2, respectively. Then the average scores from these two performance indicators were evaluated using the following criterion:

- >= 3.5 Exceeded
- >=3, < 3.5: Met
- >=2/5, < 3: Approached
- <2.5: Not Met

If 70% of students have met or exceeded the objective, we can regard the objective is met. Therefore, we can see that Objective 5 was well met, given there was only one student failing to meet the objective.

More details under Performance Indicators 5.1 and 5.2 are given below, respectively:
Performance Indicator 5.1:

- Exceeded: 26 students
- Met: 5 students
- Approached: 0 student
- Not Met: 0 student

Performance Indicator 5.2:

- Exceeded: 19 students
- Met: 10 students
- Approached: 1 student
- Not Met: 0 student

Therefore, it is seen that objectives were well met.

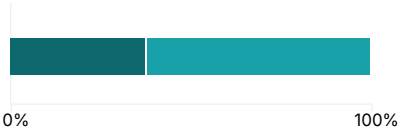
Also, as a new action, 15% class grade was allocated for ASCE participation in Fall 2024, and as a result, on average 19 out of 34 students from this class participated on ASCE events.

Generally, the assessment results from CVEN 1201 well reflect that the students were able to function effectively on a team.

Revise Measurement / Assessment

COMPLETE

Allocated 15% class grade for ASCE participation in Fall 2024.
Basis for Action: To improve the freshman participation in ASCE events.
Results: On average 19 out of 34 students from this class participated on ASCE events.

	The committee reviewed the students' samples, and discussed the assessment distribution for Outcome 5. The committee stated the assessment was rigorous and concluded that Outcome 5 was well met.	
Assessment of Outcome 5 based on CVEN 4110 based on Students' Project Summary and Peer Evaluation Senior students (CVEN 4110) were divided into groups and asked to mentor first-year students to complete the design project. The seniors were expected to provide technical advice to the freshmen and ensure the smooth running of the project. At the completion, the senior student groups were requested to submit a Project report summary with detailed meeting minutes and a summary of project outcomes. This task was aimed at evaluating the students' ability to establish goals, plan tasks, and meet objectives in a group environment. Also, both classes are asked to complete a peer evaluation to assess the participation of each group member. The assessment uses two performance indicators: 5.1) Members provide leadership and create a collaborative and inclusive environment, 5.2) Members establish goals, plan tasks, and meet objectives. Direct - Other *Seminar: CVEN 4110* **Target** The student shall be able to 1) Members provide leadership and create a collaborative and inclusive environment, 2) Members establish goals, plan tasks, and meet objectives. 70% of the students are expected to achieve the targeted threshold performance of 3.0 or higher. Peer Evaluation_3_groups.pdf Project_Reports_all5groups.pdf	MET Assessment of Outcome 5 based on CVEN 4110 based on Students' Project Summary and Peer Evaluation Exceeded Met  0% 100% *Values are not shown when too close to each other. Click or use arrow keys to see details.* **Exceeded:** 38% **Met:** 62% **Met Total:** 100% **Not Met Total:** **Analysis** There were totally 16 students for assessment under Performance Indicators 5.1 and 5.2, respectively. Then the average scores from these two performance indicators were evaluated using the following criterion: • >= 3.5 Exceeded • >=3, < 3.5: Met • >=2/5, < 3: Approached • <2.5: Not Met If 70% of students have met or exceeded the objective, we can regard the objective is met. The assessment shows that all 16 students met the requirement. Therefore, we can see that Objective 5 was well met. For more details under Performance Indicators 5.1 and 5.2, respectively: Performance Indicator 5.1: • Exceeded: 6 students • Met: 10 students • Approached: 0 student • Not Met: 0 student Performance Indicator 5.2: • Exceeded: 6 students • Met: 10 students • Approached: 0 student • Not Met: 0 student Therefore, the assessment results from CVEN 4410 well reflects that the students were able to function effectively on a team.	**Maintain Assessment Strategy** As the target was well met. No further evaluation of outcome 5 is needed until the next evaluation cycle. We will maintain the assessment strategy.

Assessment of Outcome 5 via CVEN 4313 Civil Engineering System Design Project (II)

The Senior Capstone Final Report Reflection Essay was used as the direct measurement to assess using Performance Indicators 5.1 and 5.2, respectively.

- 5.1) Members provide leadership and create a collaborative and inclusive environment,
- 5.2) Members establish goals, plan tasks, and meet objectives.

As part of the final design report, students were tasked with discussing their design process and how they integrated broader environmental, societal, and global impacts. The students were asked how they considered these broader issues within their decision-making process.

Every student in the course was assessed. The student outcome shall be attained if greater than or equal to **70%** of the entire student population receives an average score of **3 out of 4**. The final aggregated score is the average of all assessed assignments. Each assessed assignment is weighted equally.

The following attached are the final reports from 4 groups for assessment.

Civil Eng Sys Des Proj (II): CVEN 4313

Target

CVEN 4313 Civil Engineering System Design Project (II) was used to assess Outcome 5 in Spring 2025.

The outcome is regarded to be met if greater than or equal to 70% of the entire student population receives an average score of 3 out of 4.

CVEN4313_FinalReport_1.pdf

CVEN4313_FinalReport_2.pdf

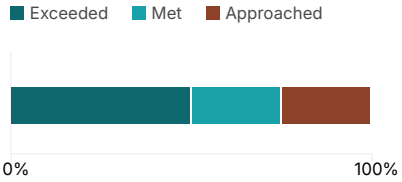
CVEN4313_FinalReport_3.pdf

CVEN4313_FinalReport_3_additional.pdf

CVEN4313_FinalReport_4.pdf

MET

Assessment of Outcome 5 via CVEN 4313 Civil Engineering System Design Project (II)



Exceeded:	50%
Met:	25%
Approached:	25%
Met Total:	75%
Not Met Total:	25%

Analysis

There were totally 12 students for assessment using Performance Indicators 5.1 and 5.2, respective, using the following criterion:

- >= 3.5 Exceeded
- >=3, < 3.5: Met
- >=2/5, < 3: Approached
- <2.5: Not Met

The Senior Capstone Final Report Reflection Essay was used as the direct measurement for assessment. The student outcome shall be attained if greater than or equal to **70%** of the entire student population receives an average score of **3 out of 4**. Each assessed assignment is weighted equally. We have the following assessment results:

- Exceeded: 6 students
- Met: 3 students
- Approached: 3 student
- Not Met: 0 student

It is seen that 9 students (75% of all) met the requirement. Therefore, Objective 5 was met.

More details under Performance Indicator 5.1:

- Exceeded: 6 students
- Met: 3 students
- Approached: 2 student
- Not Met: 1 student

More details under Performance Indicator 5.2:

- Exceeded: 6 students
- Met: 6 students
- Approached: 0 student
- Not Met: 0 student

Therefore, it is seen that the 3 students failed to meet Performance Indicator 5.1, but all well met Performance Indicator 5.2. On average, 75% of students met the requirement of Objective 5. Therefore, the assessment results from CVEN 4313 well

Revise Measurement / Assessment

COMPLETE

Improved project deliverables by requiring CAD drawing sets--including grading plans, utilities, and SWPPP.
Included one additional site visit in the spring semester, and added one guest lecture on estimating and scheduling.
Added a construction phasing deliverable.

Recommended Due Date: 04/25/2025

	reflects that the students were able to function effectively on a team.	

Conclusion

Based on the assessment of CVEN 1201, CVEN 4110 and CVEN 4313, Outcome 5 was well met.
See the assessment details in each course's assessment.

An ability to develop and conduct appropriate experiments

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

6.1 Ability to develop and conduct appropriate experimentation.
6.2 Ability to analyze and interpret data.
6.3 Ability to use engineering judgment to draw conclusions.

MEASURES	RESULTS	ACTIONS
Assessment of Outcome 6 via CVEN 3300 Engineering Materials Systems Though not formally evaluated yet in Spring 2025, some actions were implemented to improve the teaching effectiveness in Spring 2025. *Engineering Materials Systems: CVEN 3300* **Target** CVEN 3300 Engineering Materials Systems will be used to assess Outcome 6 in Spring 2027	*No results have been added.*	**Revise Measurement / Assessment** COMPLETE (1) Introduced a structural engineering term project that included the design of a MWFRS and purlin using ASCE 7-16 and NDS. (2) Students created a 3D timber frame model, used ASCE 7 to calculate dead, roof live, and wind load using the directional method. (3) Students used STAADPro to create the 3D model which leveraged wind definitions features for the windward and leeward walls, and used the auto combination feature within STAADPro to complete the analysis. (4) Students then used NDS to determine the capacity of the MWFRS elements under combined bending and axial force. Results: Students completed their two technical memos and final oral presentation successfully. Students learned how to model in 3D and using advanced features in STAADPro. Recommended Due Date: 05/06/2025
Assessment of Outcome 6 via CVEN 3390 Geotechnical Engineering Though not formally evaluated yet (to be evaluated in Spring 2027), in Spring 2025, some actions were implemented to improve teaching effectiveness. *Geo-technical Engineering: CVEN 3390* **Target** CVEN 3390 Geotechnical Engineering will be used to assess Outcome 6 in Spring 2027.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2027, and no data is collected from this course yet.	**Revise Measurement / Assessment** COMPLETE (1) Added two additional homework assignments to provide more opportunities for practice and reinforce course concepts. (2) Introduced an extra assignment: Site Observation Report (students observe and analyze either in-person or virtual construction sites), allowing practical application of geotechnical engineering principles to real-world scenarios. Recommended Due Date: 05/06/2025

An ability to acquire and apply new knowledge

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

7.1 Ability to acquire and apply new knowledge.
7.2 Ability to use appropriate learning strategies.

MEASURES	RESULTS	ACTIONS
Assessment of Outcome 7 via CVEN 3360 Engineering Hydrology *Engineering Hydrology: CVEN 3360* **Target** CVEN 3360 Engineering Hydrology will be used to assess Outcome 7 in Spring 2027.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2027, and no data is collected from this course yet.	*No actions have been added.*
Assessment of Outcome 7 via CVEN 4212 Civil Engineering System Design Project (I) Though not formally evaluated yet, some actions were implemented in Fall 2024 to improve the teaching effectiveness. *Civil Engr Systems Design Proj: CVEN 4212* **Target** CVEN 4212 Civil Engineering System Design Project (I) will be used to assess Outcome 7 in Fall 2026.	**Analysis** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Fall 2026, and no data is collected from this course yet.	**Revise Measurement / Assessment** COMPLETE Added 15 industry guest lectures and weekly quizzes to the class covering topics related to conceptual design and project proposals. Results: Students responded well to the material. weekly quizzes were well received. Recommended Due Date: 12/13/2024

BS in Civil Engineering - BS-CVEN Success Outcomes

An ability to identify, formulate & solve complex engineering problems MET

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

1.1 Identify the type of complex engineering problem.
1.2 Develop and formulate a solution methodology to solve a complex engineering problem by applying scientific, engineering, and mathematical principles.
1.3 Solve complex engineering problems.

MEASURES	RESULTS	ACTIONS

Assessment of Outcome 1 via CVEN 3370 Water and Waste Water Treatment **Target** CVEN 3370 Water and Waste Water Treatment will be used to assess Outcome 1 in Spring 2026.	**Summary** Note: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2026, and no data is collected from this course yet.	*No actions have been added.*
Assessment of Outcome 1 via CVEN 4365 Introduction to Transportation Engineering **Target** CVEN 4365 Introduction to Transportation Engineering will be used to assess Outcome 1 in Fall 2026.	**Summary** Note: according to the assessment plan during the 3-year cycle, this course will be evaluated in Fall 2026, and no data is collected from this course yet.	*No actions have been added.*
Assessment of Outcome 1 via CVEN 4350 Hydraulic Engineering **Target** CVEN 4350 Hydraulic Engineering will be used to assess Outcome 1 in Spring 2027.	**Summary** Note: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2027, and no data is collected from this course yet.	*No actions have been added.*
Assessment of Outcome 1 via CVEN 3300 Engineering Materials Systems **Target** CVEN 3300 Engineering Materials Systems will be used to assess Outcome 1 in Spring 2027.	**Summary** Note: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2027, and no data is collected from this course yet.	*No actions have been added.*

Senior Exit Survey Seniors were asked to do the exit survey to evaluate the success outcomes at the end of Spring 2025. Indirect - Survey **Target** The outcome is regarded to be met if 75% of students give a 3 (neutral) or above on a 5 point scale.	MET **Summary** From the survey results, it shows that all students gave a score 3.0 (neutral) or higher. There are two excellent (5.0) and three good (4.0). The average is 4.0. Therefore, it is regarded that the success outcome was well met. **Analysis** From the survey results, it shows that all students gave a score 3.0 (neutral) or higher. There are two excellent (5.0) and three good (4.0). The average is 4.0. Therefore, it is regarded that the success outcome was well met.	*No actions have been added.*

Conclusion

Based on the senior exit survey, the outcome was well met during 2024-2025. We will continue to evaluate the outcome based on the four courses listed in the future.

An ability to apply engineering design MET

An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as wells as global, cultural, social, environmental, and economic factors.

2.1 Engineering design solution meets specified technical standard/code/manual requirements.
2.2 Engineering design solution considers and satisfies specified public health, safety, or welfare needs and constraints.
2.3 Engineering design solution considers and satisfies specified global, cultural, social, environmental, or economic needs.

MEASURES	RESULTS	ACTIONS
Assessment of Outcome 2 via CVEN 4313 Civil Engineering System Design Project (II) **Target** CVEN 4313 Civil Engineering System Design Project (II) will be used to assess Outcome 2 in Spring 2026.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2026, and no data is collected from this course yet.	*No actions have been added.*
Assessment of Outcome 2 via CVEN 4380 Reinforced Concrete Design **Target** CVEN 4380 Reinforced Concrete Design will be used to assess Outcome 2 in Fall 2025.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Fall 2025, and no data is collected from this course yet.	*No actions have been added.*
Assessment of Outcome 2 via CVEN 3370 Water and Waste Water Treatment	**Summary**	*No actions have been added.*

Target CVEN 3370 Water and Waste Water Treatment will be used to assess Outcome 2 in Spring 2026.	**Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2026, and no data is collected from this course yet.	
Senior Exit Survey Seniors were asked to do the exit survey to evaluate the success outcomes at the end of Spring 2025. Indirect - Survey **Target** The outcome is regarded to be met if 75% of students give a 3 (neutral) or above on a 5 point scale.	MET **Summary** The responses from 7 seniors are Neutral 3.0 Excellent 5.0 Excellent 5.0 Good 4.0 Excellent 5.0 Neutral 3.0 Good 4.0 Average score: 4.1 **Analysis** From the survey results, it shows that all students gave a score 3.0 (neutral) or higher. There are three excellent (5.0) and two good (4.0). The average is 4.1. Therefore, it is regarded that the success outcome was well met. Based on the senior exit survey, the outcome is well met during 2024-2025. We will continue to evaluate the outcome based on the four courses listed in the future.	*No actions have been added.*

Conclusion

Based on the senior exit survey, the outcome was well met during 2024-2025. We will continue to evaluate the outcome based on the three courses listed in the future.

An ability to communicate effectively with a range of audiences MET

An ability to communicate effectively with a range of audiences.

3.1 Ability to communicate orally to a wide range of audiences.
3.2 Ability to communicate in written form.
3.3 Ability to communicate technical drawings, schematic, figures, and tables to a wide range of audiences.

MEASURES	RESULTS	ACTIONS
Assessment of Outcome 3 via CVEN 4313 Civil Engineering System Design Project (II) **Target**	**Analysis** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2026, and no data is collected from this course yet.	*No actions have been added.*

CVEN 4313 Civil Engineering System Design Project (II) will be used to assess Outcome 3 in Spring 2026.		
Senior Exit Survey Seniors were asked to do the exit survey to evaluate the success outcomes at the end of Spring 2025. Indirect - Survey **Target** The outcome is regarded to be met if 75% of students give a 3 (neutral) or above on a 5 point scale.	MET **Summary** The response from seniors are Neutral 3 Excellent 5 Excellent 5 Good 4 Excellent 5 Neutral 3 Excellent 5 The average is 4.3 **Analysis** From the survey results, it shows that all students gave a score 3.0 (neutral) or higher. There are four excellent (5.0) and one good (4.0). The average is 4.3. Therefore, it is regarded that the success outcome was well met.	*No actions have been added.*

Conclusion

Based on the senior exit survey, the outcome was well met during 2024-2025. We will continue to evaluate the outcome based on the course listed in the future.

An ability to recognize ethical and professional responsibilities MET

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 social contexts.

4.1 Recognize ethical responsibilities in engineering situations.
4.2 Recognize professional responsibilities in engineering situations.
4.3 Make informed judgments considering impact of engineering solutions.

MEASURES	RESULTS	ACTIONS
Evaluation of Outcome 4 through CVEN 4110 based on Students' Case Studies In CVEN 4110, students were given a wide range of case studies to discuss and comment. The students were expected to use the National Society of Professional Engineers (NSPE) Code of Ethics to recognize ethical and professional responsibilities in these engineer Case Studies 1, 6, and 8 from 16 students in CVEN 4110 were used to evaluate the following two **performance indicators**, respectively.	MET Reults_CVEN4110_Obj_4.pdf **Analysis** In the attached evaluation report, Table 1 shows the assessment details of each student in three case studies from CVEN 4110 in Fall 2024. We can see that the target thresholds were completely met for both Performance Indicators 4.1 and 4.2: 100% exceeded the targeted threshold performance of 3.0. In the attached result report, it shows the final grade distribution of this course. It is consistent with the assessment results of	**Maintain Assessment Strategy** Since the results are good. No additional action plan is needed. No further evaluation of outcome 4 is needed until the next evaluation cycle. We will maintain the assessment strategy.

• 4.1: Recognize ethical responsibilities in engineering situations, • 4.2: Recognize professional responsibilities in engineering situations. Direct - Other **Target** Two performance indicators were used for assessment: 4.1) Recognize ethical responsibilities in engineering situations, 4.2) Recognize professional responsibilities in engineering situations. 70% students are expected to achieve the targeted threshold performance of 3.0 or higher. Fall 2024_Case Studies.pdf	Table 1: most students (15 out of 16 students) got A or B. Conclusion: the students' samples were reviewed by the committee. The committee stated the assessment was rigorous and concluded that Outcome 4 was well met.	
Assessment of Outcome 4 via CVEN 4313 Civil Engineering System Design Project (II) The assessment was completed using rubric (likert scale 1-4) and the performance indicator 4.3 was assessed using the assignments described below. **Performance Indicator 4.3: make informed judgments considering impact of engineering solutions.** The Senior Capstone Final Report Reflection Essay was used as the direct measurement to assess Performance Indicator 4.3. As part of the final design report, students were tasked with discussing their design process and how they integrated broader environmental, societal, and global impacts. The students were asked how they considered these broader issues within their decision-making process. Every student in the course was assessed. The student outcome shall be attained if greater than or equal to **70%** of the entire student population receives an average score of **3 out of 4**. The final aggregated score is the average of all assessed assignments. Each assessed assignment is weighted equally. Then, an average score was computed for every student in the assessed course. An average score of 3/4 indicates a student has an "accomplished" performance. The following attached are the Final Reports from 4 groups. These reports were used for assessment. **Target**	MET Spring 2025_4313_Asessment_Results.pdf **Analysis** The Senior Capstone Final Report Reflection Essays from 12 students were used as the direct measurement to assess Performance Indicator 4.3. Every student in the course was assessed. The student outcome shall be attained if greater than or equal to **70%** of the entire student population receives an average score of **3 out of 4**. The final aggregated score is the average of all assessed assignments. Each assessed assignment is weighted equally. Then, an average score was computed for every student in the assessed course. An average score of 3/4 indicates a student has an "accomplished" performance. The assessment shows that all 12 students have score no less than 3.2 for Performance Indicator 4.3. Therefore, it well indicates that this objective is well met.	**Revise Measurement / Assessment** COMPLETE Improved project deliverables by requiring CAD drawing sets--including grading plans, utilities, and SWPPP. Included one additional site visit in the spring semester, and added one guest lecture on estimating and scheduling. Added a construction phasing deliverable. Recommended Due Date: 04/25/2025

Every student (12 students in total) in the course was assessed for Performance Indicator 4.3. The student outcome shall be attained if greater than or equal to 70% of the entire student population receives an average score of 3 out of 4. Performance Indicator 4.3: make informed judgments considering impact of engineering solutions. CVEN4313_FinalReport_1.pdf CVEN4313_FinalReport_2.pdf CVEN4313_FinalReport_3.pdf CVEN4313_FinalReport_3_additional.pdf CVEN4313_FinalReport_4.pdf		
Senior Exit Survey Seniors were asked to do the exit survey to evaluate the success outcomes at the end of Spring 2025. Indirect - Survey **Target** The outcome is regarded to be met if 75% of students give a 3 (neutral) or above on a 5 point scale.	MET **Summary** Neutral 3 Excellent 5 Excellent 5 Good 4 Excellent 5 Neutral 3 Excellent 5 The average is 4.3. **Analysis** From the survey results, it shows that all students gave a score 3.0 (neutral) or higher. There are four excellent (5.0) and one good (4.0). The average is 4.3. Therefore, it is regarded that the success outcome was well met.	*No actions have been added.*

Conclusion

Based on the evaluation of CVEN 4110 and CVEN 4313, as well as the senior exit survey, the success outcome was well met. Please see the details in each course.
We will continue to evaluate this outcome in the future.

An ability to function effectively on a team MET

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.

5.1 Members provide leadership and create a collaborative and inclusive environment.
5.2 Members establish goals, plan tasks, and meet objectives.

MEASURES	RESULTS	ACTIONS

Assessment of Outcome 5 based on CVEN 1201 via Peer Evaluation and Presentation The freshmen students (CVEN1201) were requested to design a coffee mug tree stand made from plastic to meet specific design specifications and constraints. For the design, the students are expected to use Fusion 360 (3-D modeling software). At the end of the project, the freshmen will be requested to present their work in a class setting and be evaluated. This task was designed to evaluate the students' ability to function effectively on a team and create a collaborative environment. The assessment uses two performance indicators: • 5.1) Members provide leadership and create a collaborative and inclusive environment, • 5.2) Members establish goals, plan tasks, and meet objectives. Direct - Other **Target** The student shall be able to 5.1) Members provide leadership and create a collaborative and inclusive environment, 5.2) Members establish goals, plan tasks, and meet objectives. 70% of the students will achieve the targeted threshold performance of 3.0 or higher. Group 1.pptx Group 2.pptx Group 3.pptx Group 4.pptx Peer Evaluations.pdf	MET Fall 2024_Assessment Final Document_CVEN1201 - Outcome 5.pdf **Analysis** In the attached document, the summary table shows the assessment results of each student in CVEN 1201 for Performance Indicators 5.1 and 5.2, respectively. We can see that for both indicators, the target threshold was met for most students: 88% exceeded the targeted threshold performance of 3.0, and only 4 out 34 were below 3.0 (as highlighted in Table 3). Note that among these 4 students, 3 students had very low points (<1.0), and they failed in this course, as shown in second table of Final Grade Distribution. Also, as a new action, 15% class grade was allocated for ASCE participation in Fall 2024, and as a result, on average 19 out of 34 students from this class participated on ASCE events. Generally, the assessment results from CVEN 1201 well reflect that the students were able to function effectively on a team. The committee reviewed the students' samples, and discussed the assessments. The committee stated the assessment was rigorous and concluded that Outcome 5 was well met.	**Revise Measurement / Assessment** COMPLETE Allocated 15% class grade for ASCE participation in Fall 2024. Basis for Action: To improve the freshman participation in ASCE events. Results: On average 19 out of 34 students from this class participated on ASCE events.
Assessment of Outcome 5 based on CVEN 4110 based on Students' Project Summary and Peer Evaluation For outcome 5, senior students (CVEN 4110) were divided into groups and asked to mentor first-year students to complete the design project. The seniors were expected to provide technical advice to the freshmen and ensure the smooth running of the project. At the completion, the senior student groups were requested to submit a Project report summary with detailed meeting minutes and a summary of project outcomes. This task was aimed at evaluating the students' ability to establish goals, plan tasks, and meet objectives in a group environment. Also, both classes are asked to complete a peer	MET Fall 2024_Assessment Final Document_CVEN4110 - Outcome 5.pdf **Analysis** In the attached evaluation report, the table of the summary data shows the assessment results of each student in CVEN 4110 for Performance Indicators 5.1 and 5.2, respectively. For both indicators, the target threshold was met for all students: all students' assessment results were higher than 3.0. As shown in the result report, 15 out of 16 students in CVEN 4110 got a grade of A or B, and only one got a grade of C. Therefore, the final grade distribution (as shown in second table in the attached	**Maintain Assessment Strategy** As the target was well met. No further evaluation of outcome 5 is needed until the next evaluation cycle. We will maintain the assessment strategy.

evaluation to assess the participation of each group member. Direct - Other **Target** The student shall be able to 1) Members provide leadership and create a collaborative and inclusive environment, 2) Members establish goals, plan tasks, and meet objectives. The assessment will be completed using a rubric (likert scale 1-4) and the performance indicators listed on the rubric shall be assessed using the assignments described below. Every student in the course will be assessed. 80% of the students are expected to achieve the targeted threshold performance of 3.0 or higher. Peer Evaluation_3_groups.pdf Project_Reports_all5groups.pdf	evaluation report) well reflects the assessment results of students in CVEN 4110. Generally, the assessment results from CVEN 4410 well reflects that the students were able to function effectively on a team.	
Assessment of Outcome 5 via CVEN 4313 Civil Engineering System Design Project (II) The Senior Capstone Final Report Reflection Essay was used as the direct measurement to assess using Performance Indicators 5.1 and 5.2, respectively. • 5.1) Members provide leadership and create a collaborative and inclusive environment, • 5.2) Members establish goals, plan tasks, and meet objectives. As part of the final design report, students were tasked with discussing their design process and how they integrated broader environmental, societal, and global impacts. The students were asked how they considered these broader issues within their decision-making process. Every student in the course was assessed. The student outcome shall be attained if greater than or equal to **70%** of the entire student population receives an average score of **3 out of 4**. The final aggregated score is the average of all assessed assignments. Each assessed assignment is weighted equally. The following attached are the final reports from 4 groups for assessment. **Target** CVEN 4313 Civil Engineering System Design Project (II) was used to assess Outcome 5 in Spring 2025. The outcome is regarded to be met if greater than or equal to 70% of the entire student population receives an average score of 3 out of 4.	MET Spring 2025_4313_Asessment_Results.pdf **Analysis** The details of the assessment are attached. From all 12 students, 9 students have the assessment scores higher than 3.0 for Performance Indicator 5.1, i.e., 75% students met the requirement; while for Performance Indicator 5.2, all students have assessment scores higher than 3.0. Therefore, this outcome were well met.	**Revise Measurement / Assessment** COMPLETE Improved project deliverables by requiring CAD drawing sets--including grading plans, utilities, and SWPPP. Included one additional site visit in the spring semester, and added one guest lecture on estimating and scheduling. Added a construction phasing deliverable. Recommended Due Date: 04/25/2025

Spring 2025_4313_Asessment_Results.pdf		
Senior Exit Survey Seniors were asked to do the exit survey to evaluate the success outcomes at the end of Spring 2025. **Target** The outcome is regarded to be met if 75% of students give a 3 (neutral) or above on a 5 point scale.	MET **Summary** The responses from 7 seniors are Neutral 3 Excellent 5 Excellent 5 Good 4 Excellent 5 Neutral 3 Excellent 5 The average is 4.3. **Analysis** From the survey results, it shows that all students gave a score 3.0 (neutral) or higher. There are four excellent (5.0) and one good (4.0). The average is 4.3. Therefore, it is regarded that the success outcome was well met.	*No actions have been added.*

Conclusion

From the assessment of CVEN 1201, CVEN 4110 and CVEN 4313, as well as the senior exit survey, Outcome 4 was well met. Please see the detailed assessment data in the folder of each course.
We will continue to evaluate this outcome in the future.

An ability to develop and conduct appropriate experiments MET

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

6.1 Ability to develop and conduct appropriate experimentation.
6.2 Ability to analyze and interpret data.
6.3 Ability to use engineering judgment to draw conclusions.

MEASURES	RESULTS	ACTIONS
Assessment of Outcome 6 via CVEN 3300 Engineering Materials Systems **Target** CVEN 3300 Engineering Materials Systems will be used to assess Outcome 6 in Spring 2027.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Spring 2027, and no data is collected from this course yet.	*No actions have been added.*
Assessment of Outcome 6 via CVEN 3390 Geotechnical Engineering	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will	**Revise Measurement / Assessment** COMPLETE (1) Added two additional homework assignments to provide more opportunities

Thought not formally evaluated yet, in Spring 2025, some actions were implemented to improve teaching effectiveness. **Target** CVEN 3390 Geotechnical Engineering will be used to assess Outcome 6 in Spring 2027.	be evaluated in Spring 2027, and no data is collected from this course yet.	for practice and reinforce course concepts. (2) Introduced an extra assignment: Site Observation Report (students observe and analyze either in-person or virtual construction sites), allowing practical application of geotechnical engineering principles to real-world scenarios. Results: These improvements enhanced students engagement, practice, and understanding of geotechnical engineering principles. Recommended Due Date: 05/06/2025
Senior Exit Survey Seniors were asked to do the exit survey to evaluate the success outcomes at the end of Spring 2025. **Target** The outcome is regarded to be met if 75% of students give a 3 (neutral) or above on a 5 point scale.	MET **Summary** There are 6 responses from 7 seniors: Neutral 3 Excellent 5 Excellent 5 Good 4 Good 4 n/a n/a Excellent 5 The average is 4.3 from 6 response. Ober 85% of the students have a score of 3.0 or higher. **Analysis** From the survey results, it shows that 6 of 7 students gave a score 3.0 (neutral) or higher. Over 85% of students have a score of 3.0 or higher -- there are 4 excellent (5.0), and 1 good (4.0). It well indicates the outcome was well met.	*No actions have been added.*

Conclusion

Based on the senior exit survey, the outcome is well met during 2024-2025. We will continue to evaluate the outcome based on the two courses listed in the future.

An ability to acquire and apply new knowledge MET

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

7.1 Ability to acquire and apply new knowledge
7.2 Ability to use appropriate learning strategies.

MEASURES	RESULTS	ACTIONS
Assessment of CVEN 3360 Engineering Hydrology	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will	*No actions have been added.*

Target CVEN 3360 Engineering Hydrology will be used to assess Outcome 7 in Spring 2027.	be evaluated in Spring 2027, and no data is collected from this course yet.	
Assessment of Outcome 7 via CVEN 4212 Civil Engineering System Design Project (I) **Target** CVEN 4212 Civil Engineering System Design Project (I) will be used to assess Outcome 7 in Fall 2026.	**Summary** **Note**: according to the assessment plan during the 3-year cycle, this course will be evaluated in Fall 2026, and no data is collected from this course yet.	*No actions have been added.*
Senior Exit Survey Seniors were asked to do the exit survey to evaluate the success outcomes at the end of Spring 2025. Indirect - Survey **Target** The outcome is regarded to be met if 75% of students give a 3 (neutral) or above on a 5 point scale.	MET **Summary** The responses from 7 seniors are Neutral 3 Excellent 5 Excellent 5 Good 4 Excellent 5 Neutral 3 Excellent 5 The average is 4.3. **Analysis** From the survey results, it shows that all students gave a score 3.0 (neutral) or higher. There are four excellent (5.0) and one good (4.0). The average is 4.3. Therefore, it is regarded that the success outcome was well met.	*No actions have been added.*

Conclusion

Based on the evaluation of the senior exit survey, the success outcome was well met. We will continue to evaluate this outcome based on two courses listed above in the future.