

Program Outcomes:

Graduates of the Bachelor of Science degree in Engineering Technology: Civil Engineering Technology program shall have:

- (1) an ability to apply knowledge, techniques, managerial skills, and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline;
- (2) an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;
- (3) an ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;
- (4) an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes; and
- (5) an ability to function effectively as a member as well as a leader on technical teams.

Montana State University - Northern

Program Assessment Annual Report (AR)

College: COTS

Program Subject: Civil Engineering Technology

Degree (e.g., minor, AS, BS): BS

Program Mission Statement: Graduates of civil engineering technology programs will have the technical and managerial skills necessary to enter careers in the planning, design, construction, operation or maintenance of the built environment and global infrastructure.

Primary Assessment Contact: Jeremy Siemens

Date: 9/30/22

1. Which program-level student learning outcomes were assessed in this annual assessment cycle? (Comprehensive program learning outcomes can be found in your most recent assessment plan and the [MSUN Catalog](#).)

Outcome 1

Successful students will have an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline;

Outcome 2

Successful students will have an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;

2. What data or artifacts of student learning were collected for each assessed outcome? Please indicate which courses the data/artifacts were from.

Outcome 1

Project presentation with design in Capstone Course ETCC 489 demonstrating ability to apply knowledge (calculations) techniques (surveying), mathematics (calculations), engineering (design drawing), technology (computer presentation) for engineering problem.

Outcome 1

Lab report from SRVY 230 showing surveying technique and skill, use of modern survey equipment, while using modern technology (survey equipment and computer).

Outcome 2

Apply concept of concrete and soils to design a footing/foundation system with Mathcad in ETCC

411

3. How did you analyze this assessment data? For example: What was the process? Who was involved?
NOTE: If you used rubrics as part of your analysis, please include them in an appendix.

CET Faculty collected the data from student work and completed the rubrics

4. Summarize the major findings of your analysis for each assessed outcome.
NOTE: If necessary, include any tables, charts, or graphs in an appendix.

One class (ETCC 361) where there was low enrollment in the Fall of 2021 was not adequate for using as an assessment tool (Outcome 2). The outcome was assessed in only one location (ETCC 411). The same class (ETCC 361) will be used in the Fall of 2022 for a larger sampling.

For Outcome 1 at the sophomore level (SRVY 230) 62.5% meet the desired outcome. It should be noted that 2 students did not complete the required assignment also did not pass the class so they would not be considered a graduate until they retake the course. At the senior level, 1/1 student met the criteria for outcome 1. The sample size was small but measured in the capstone course.

For Outcome 2, again the sample size for the 2022 class was small (1/1), so the class from 2021 was used. Four of the five students met the goal. It should be noted that the student who did not meet the outcome in 2021, did meet the outcome in 2022. The second measure for outcome 2 also had a small sample size, so Data from the Fall 2022 semester for ETCC 361 will be used. This report will be updated when that information is assessed.

5. Moving forward, how will you be using these findings to make or implement recommendations for program improvement? For example: change in pedagogy, curriculum design, assessment plan

Lab reports and capstone courses seem to be better places to collect data from outcomes. Requiring a design component to the labs in ETCC 385, ETCC 361, and ETCC 411 may yield better information than current homework assignments.

6. Looking back, have you been able to close the loop on past assessment findings (i.e., findings from prior years' reports)? For example: Has that curriculum change you made two years ago manifested in improved student learning today, as evidenced in your recent assessment data and analysis?

Not yet, as last year's report only measured Outcomes 3-5. This will be assessed in the Fall of 2023.

IMPORTANT: If these findings lead you to revise/update your learning outcomes or your assessment plan moving forward, please submit that revised plan along with this report.

2021-2022 ABET ETAC Commission Outcome: 1		Students shall demonstrate an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline				
Performance Indicator:		Unsatisfactory 1	Developing 2	Satisfactory 3	Exceeds Required 4	Where Measured
SRVY 230 - Horizontal Curve Lab		Did not Complete	Completed But with Major Errors	Completed with Minor Errors or Poor Formatting	Completed with No Errors and Format Explains Solution	ETCC 361
	Total					Semester Assessed
Students in Each Group	8	2	1	2	3	Fall 2021
Percent of Students meeting outcome		62.5%		Comments for Continuous Improvements: Students that did not complete the lab did not pass the course		
Performance Indicator:						
ETCC 489 Student Presentation from Fall and Spring		Basic or Incomplete Design or Statement	CADD Design without Design Calculations or References	Complete CADD Design w/Calculations and References	CADD Design, Calcs., References, and Specifications	ETCC 489
	Total					Semester Assessed
Students in Each Group	1				1	Fall 2021
Percent of Students meeting outcome		100.0%		Average Percent Meeting Outcome		81.3%
		Comments for Continuous Improvements:		Small Sample Size		

2021-2022 ABET ETAC Commission Outcome: 2		Students shall demonstrate an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline				
Performance Indicator:		Unsatisfactory 1	Developing 2	Satisfactory 3	Exceeds Required 4	Where Measured
ETCC 411 - Design a Concrete Footing		Did Not Complete	Design incorrectly with major errors in methods.	Design with correct methods, but with minor errors.	Design with correct equations and methods w/o errors.	ETCC 302
Total						Semester Assessed
Students in Each Group	5	1		3	1	Spring 2022
Percent of Students meeting outcome		80.0%				
<u>Comments for Continuous Improvements:</u>						
Performance Indicator:		Unsatisfactory 1	Developing 2	Satisfactory 3	Exceeds Required 4	Where Measured
ETCC 361 - Design Structural system		Did Not Complete	Design system incorrectly with major errors in methods.	Design system with correct methods, but with minor errors.	Design system with correct problem statement, equations and methods.	ETCC 361
Total						Semester Assessed
Students in Each Group	0					Spring 2022
Percent of Students meeting outcome		#DIV/0!				
<u>Comments for Continuous Improvements:</u>						
		Average Percent Meeting Outcome			#DIV/0!	
SMALL SAMPLE SIZE FOR 2021, NEED TO UPDATE IN FALL 2022						

Civil Engineering Technology Enrollment Data

Academic Year Count of Students

*Measures Individual Students Enrolled throughout the AY

	Years	1st	2nd	3rd	4th +	Total Undergrad	Degrees Awarded		
							Associates	Bachelors	
Current	2022-2023		7	5	5	8	25		3
1	2021-2022		4	4	5	7	20		1
2	2020-2021		3	4	0	5	12		3
3	2019-2020		4	2	4	6	16	1	5
4	2018-2019		2	6	3	7	18	1	5

Semester Count of Students

*Measures Students enrolled at any one time at end of semester.

Major Count

Eng Tech: Civil Engineer Tech

Code

B21

Description

Eng Tech: Civil Engineer Tech

Civil Engineer - NON Duplicated

