

Civil Engineering Technology (AAS) 517

- Assessment summary

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- Complete ABET accreditation last year using the outcomes based assessment approach for the 3rd time.
- Seems that we have a handle on this process
- Continuous improvement process is on-going.

Outcomes

Graduates of the Civil Engineering Technology program will be able to...

- 1. Communicate effectively and professionally in the construction environment through proper use of verbal, written, and graphic techniques.*
- 2. Develop mathematical skills in algebra, trigonometry, and calculus, using analytical problem-solving methods.*
- 3. Employ logical and concise analytical techniques to solve technical problems.*
- 4. Demonstrate the capability to develop engineering drawings for construction projects.*
- 5. Demonstrate a thorough knowledge of common construction materials; both their proper use and their proper testing procedures.*
- 6. Understand the mechanics of structural design.*
- 7. Be proficient in the use of surveying equipment to collect data, to lay out projects, and to solve engineering problems.*
- 8. Function effectively as a member of a technical team.*

Typical Evaluation Table

Example SO achievement evaluation table				
PO #7 Evaluation				YEAR 201
<i>Program Outcome #7. Be proficient in the use of surveying equipment to collect data, to lay out projects solve engineering problems.</i>				
FROM	Individual Responsible	Measurement Tool (Evidentiary Item)	Target/ Desired Outcome	Actual Achieveme (Result)
CONS101 ELEMENTARY and CONS203 ADVANCED SURVEYING	BB	Dexterity Tests	The average number of attempts needed to achieve a passing score will be 1.25.	
CONS101 ELEMENTARY SURVEYING	BB	Lab: Level Loop 2	80% of the parties will complete the project with 3 rd order accuracy or better	
CONS101 ELEMENTARY SURVEYING	BB	Lab: Stake out residence	80% of the parties will locate the corners of the building within \pm 0.04 ft of the specified location.	
CONS203 ADVANCED SURVEYING	BB	Layout a Road with horizontal and vertical curves including grade and slope stakes	80% of the parties will set the PT _{BACK} within 0.08' of the PT _{AHEAD} and will set all of the assigned grade and slope stakes.	
CONS203 ADVANCED SURVEYING	BB	Satisfactory collection and processing of a body of data required to develop topographical map used in the lab's mapping project	80% of the parties will achieve a score of 80% or better in the grading for quality and completeness of data.	

Indirect Measure: Employer Survey

RATE THE GRADUATE WITH RESPECT TO ACQUISITION OF OUR MAJOR LEARNING OUTCOMES

- 5 = exceptional ability and preparation
- 4 = better than expected ability/preparation
- 3 = **ability and preparation as expected of a two-year graduate**
- 2 = ability and preparation lower than expected of two year grad
- 1 = individual was not prepared well in this area
- NA = skill not required in this position

1. written communications	NA	1 5	2	3	4
2. spoken communications	NA	1 5	2	3	4
3. graphic communication (interpret and prepare plans)	NA	1 5	2	3	4
4. ability to apply math concepts (Algebra, Geometry, Trigonometry, Calculus) in the solution of construction/civil technology related problems.	NA	1 5	2	3	4
5. employment of logical and concise analytical techniques to solve technical problems.	NA	1 5	2	3	4
6. ability to develop engineering drawings for construction projects.	NA	1 5	2	3	4
7. knowledge of the properties, uses and testing of common construction materials	NA	1 5	2	3	4
8. understanding of the key mechanical principles related to structural analysis and design	NA	1 5	2	3	4
9. proficiency in the use of surveying equipment, surveying field procedures and application of surveying data	NA	1 5	2	3	4
10. Ability to estimate material quantities for project planning, bidding, etc.	NA	1 5	2	3	4
11. Demonstrates strong work ethic and responsible behavior	NA	1 5	2	3	4

Comments: (Please expand on any items that you found the individual had inadequate training.

Identifying concerns as a result of measurements

SUNY Canton--CSOET
Assessment Action Summary

Program _____ Initiator _____ Date _____

Part I. Describe the measurement taken and the source of the desired outcome that has a deficiency.

Assessment Area (Program Objective, Operational Objective, Program Learning Outcome, Course Outcome)

Trigger

Measurement

Part II. Describe the action taken as a response to the deficiency noted above. Include names and dates.

Part III. Describe the program improvement or assessment plan change that has occurred as a direct result of the action taken.

As a result of this action.....

Part IV. Follow up measurement. At the earliest possible date, conduct the measurement again to verify the resolution of the issue.

Summary of findings

	A OK	Needs Work
PEO 1. Upon completion of the requirements of the Civil Engineering Technology program, the graduate will be able to find satisfying work at the technician level in the Civil Engineering field and, with experience, advance to management level positions in this area.	x	
PEO 2. Graduates of the Civil Engineering Technology program will be prepared academically to enter and succeed in related bachelor's degree programs at reputable institutions.	x	
PEO 3. Graduates will have developed the personal and academic skills required to pursue lifelong learning in, and beyond, the chosen major.	x	
SO #1 Communicate effectively and professionally in the construction environment through proper use of verbal, written, and graphic techniques.		x
SO #2. Develop mathematical skills in algebra, trigonometry, and calculus, using analytical problem solving methods.		x
SO #3. Employ logical and concise analytical techniques to solve technical problems.	x	
SO #4. Demonstrate the capability to develop engineering drawings for construction projects.	x	
SO #5. Demonstrate a thorough knowledge of common construction materials; both their proper use and their proper testing procedures.		x
SO #6. Understand the mechanics of structural design.		x
SO #7. Be proficient in the use of surveying equipment to collect data, to lay out projects, and to solve engineering problems.	x	
SO #8. Function effectively as a member of a technical team.	x	
ABET g. an understanding of the need for and an ability to engage in self directed continuing professional development;		x
ABET h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity		x
ABET i. a commitment to quality, timeliness, and continuous improvement.	x	

4.B.2.b. Assessment of Student Outcomes – Review of Measurement Tools

- The tools we employed for this periodic review were generated about 8 years ago and it is natural that over time factors such as instructional changes, personnel changes, and especially curricular revisions cause certain tools to become obsolete.
- wherever possible, an outcome should be assessed with both: the test performance serving as a validation of sorts.

“CLOSING THE LOOP”

- What we proposed to do to keep things moving in the right direction academically.
- Excerpts taken from our report which is available on the web site.

4.B.2.c. Evaluation Process –Comprehensive Review of Student Outcome Achievement

- regularly scheduled assessment meetings
- review of continuous improvement action items that are completed, in progress, or being initiated.

4.B.2.d. Evaluation Process – Sharing Assessment Materials and Documents

- The problem we have had is centrally locating these binders that they may be accessed by all faculty on a regular basis so that they may be updated as materials are generated.
- to improve this part of the process an online space was been generated in Angel.
- Now taskstream provides a common place

4.B.2.e. Curriculum

course changes may be enacted by Spring 2015.

- Remove ENGS102 – Intro to Programming (2 credits)
- Add CONS222 – Construction Estimating (2 credits)
- Reduce CONS203 - Advanced Surveying to 3 credit hours, content must be cut but the majority and essential topics can be retained. Rewrite course outline to include an update of learning outcomes.
- Remove FYEP101- First Year Experience and replace it with ENGS101- Introduction to Engineering.
- Require all civil students to participate in the ASCE club for a minimum of one term.

4.B.2.f. Student Outcome #1 - Writing Skills

- require students to prepare a draft
- developed a grading rubric for laboratory reports
- develop a common Communication Guidance Document
 - clear and consistent requirements and guidelines from semester to semester will overcome the learning curve

4.B.2.g Student outcome #1 – Use of Technical Literature

- The existing rubric will be revised to include this level of detail for evaluating the use of technical literature in reports.
- there will be a section in the Communication Guidance Document (discussed above in **Section 4.B.2.o**) on proper use of technical literature.

4.B.2.h Student Outcome #1 – Graphing Skills

- faculty were made aware of the issue and asked to make a concerted effort to improve on this.
- A measurement tool will be added to the assessment procedures that will identify graphing skills demonstrated in CONS322 so that we can formally track the progress.
- We have proposed that all civil students be placed in one section of ENGS101 in Fall 2014 and one of the program faculty will serve as instructor.

4.B.2.i Student Outcome #2 developing math skills through applications

- in response to several terms with poor scores on a performance indicator from CONS 101 Elementary Surveying (TRAVERSE PROCESSING)
- instructor took the following actions: (1) Insisted that the registrar reschedule labs to two consecutive days that would not be effected by the holiday. (2) Provided thorough instruction on traverse calculations prior to conducting the field work. (3) Informed the students that the traverse computations (the most difficult part of the class) would be the topic of an entire unit exam, and (4) allowed students to process their field traverse as a group as had been done in the past, but with the availability of a spreadsheet that they could use to check their calculations.
- As a result 78% of the students demonstrated proficiency

4.B.2.j Student Outcome #4 Knowledge of Construction Materials

- No data collected: remedy this by assigning an experienced instructor to develop the course and ensure the assessment data is obtained.
- Student familiarity with the conduct and interpretation of tensile tests of steel and aluminum has come into question. We intend to remedy this by ensuring the material is covered thoroughly and CONS272 (STILL a problem!) coordinate the materials lab class to coincide with CONS272

4.B.2.k Student Outcome #6 Structural Design

unacceptable failure rates and lack of achievement re: stress/strain and computation of tensile, shear and compressive stress.

- the use of juniors and seniors from the Civil and Environmental technology program as tutors.
- Find new instructor (done in 2015): result Target met*
 - 48% on exam 1
 - 80% on final exam

4.B.2.m Student Outcome #8 (Teamwork)

our measurement tools lack objectivity.

At least one of the measurement tools will be give students an opportunity to perform peer assessment using a group participation/leadership rubric. **DONE in ENGS101 this term.**

increase the participation of the civil-2 year students in the ASCE bridge team. **DONE this year.**

4.B.2.n ABET Student Outcome g. Pursuit of professional development

- a recognized shortcoming
- Instructor failure to document acquisition
- curriculum changes address this
- Adding ENGS101 will ensure the students are engaged in a unit that presents the requirements and expectations of engineers, impact of engineering decisions on society and the benefit of professional societies. Requiring students to be involved in the ASCE club will expose them to the workings and opportunities presented by participation in ASCE. And adding a separate course on estimating will provide more time in CONS274 – Construction Management to gain familiarity with the field through professional journal reading and writing. Currently this course must cover contract documents, estimating, and scheduling. Estimating will become a separate topic of the added course CONS222.

4.B.2.o ABET Student Outcome h. Professional Ethics, societal impact

- failure to document consistent acquisition of the outcome
- curriculum changes address this shortcoming

4.B.2.p ABET Student Outcome i. Commitment to timeliness, quality

- developing an objective measurement of this outcome is somewhat problematic
- Since “timeliness” can be related to appreciation of the importance of adhering to a schedule, we expect to improve on the students’ ability in this area by dedicating more time to project scheduling in CONS274
- a common standard format that provided in the CSOET guidelines document will encourage quality work, especially if students are required to meet these standards and follow guidelines starting in the first semester.

Budget

- No requests have been made to specifically address these shortcomings
- Bridge team monetary support has been well utilized
- Recent lab improvements but must ensure budget is sufficient to maintain proper supplies
- Expensive recalibration of equipment should be requested
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