



Academic Program Assessment Report for AY 2018-2019

Program: Construction Management

(Due: June 1, 2019)

Date report completed: May 31, 2019

Completed by: Michael Mincic

Assessment contributors (other faculty involved): Md Islam

Please describe the 2019-20 assessment activities and follow-up for your program below. Please complete this form for each undergraduate major, minor, certificate, and graduate program (e.g., B.A., B.S., M.S.) in your department. Please copy any addenda (e.g., rubrics) and paste them in this document, save and submit it to both the Dean of your college/school and to the Assistant Provost as an email attachment before June 1, 2018. You'll also find this form on the assessment website at <https://www.csueblo.edu/assessment-and-student-learning/resources.html>. Thank you.

I. Assessment of Student Learning Outcomes (SLOs) in this cycle. Including processes, results, and recommendations for improved student learning. Use Column H to describe improvements planned for 2018-2019 based on the assessment process.

A. Which of the program SLOs were assessed during this cycle? Please include the outcome(s) verbatim from the assessment plan.	B. When was this SLO <u>last</u> assessed? (semester and year)	C. What method was used for assessing the SLO? Please include a copy of any rubrics used in the assessment process.	D. Who was assessed? Please fully describe the student group(s) and the number of students or artifacts involved.	E. What is the expected achievement level and how many or what proportion of students should be at that level?	F. What were the results of the assessment? Include the proportion of students meeting proficiency.	G. What were the department's conclusions about student performance?	H. What changes/improvements to the <u>program</u> are planned based on this assessment?
Outcome #2 Select and apply the knowledge of mathematics, science and technology to construction problems.	AY 2016/17	As part of the senior project experience each student team is required to interview and determine the clients expectations for project deliverables. The	CM 475- Senior Project	-75% will attain 75%	- 90% attained 75%	The CM 475 is a one semester course in which the students as a team are required to identify their capstone project's; scope of work, deliverables,	While the CM curricula contains strong elements of engineering design the most used computational analysis is completed in forecasting project costs. Perhaps one of the design courses should be used in future assessments. The current assessment of student industry

		<p>team will apply the necessary math and science to meet the project needs.</p>				<p>details, required data collection and communications with the client. This assessment looked at 4 senior projects for the use of mathematics within the project. All projects contained a strong strong amount of mathematics in determining construction related costs. All of the projects were preconstruction planning and estimating. Mathematical activities mainly focused around determining quantity of materials or services from construction docs or in field determination. Computation of projected costs were presented in the final report documents.</p>	<p>preparedness is obvious and strong in the information assessed. No Changes should be made. The strong and rigorous process should continue.</p>
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Outcome 6- Demonstrate an understanding of professional and ethical responsibilities.	AY 2016/17	Throughout the semester the students are introduced to 8 intensive modules of instruction related to the Laws effecting the construction industry. Students are given written exams, critical think problems, group projects, discussion excercises to ensure the subject competence. The student understanding of ethical issues are extremely prevalent in the course and the following scores results represent the course as a whole. The example represents one part.	CM 461- Construction Law Students	75% will attain 75%	100% attained 75% Class average = 84.84%	CM 461 is a one semester course in which the students are required to prepare the senior level student with information of the legal aspects of the construction profession at the management level. Since this course uses a series of modules each module contains a specific critical discussion topic. In this this assesement the scores of one individual projects were compared to the percentage of the entire semester and then compared to the standard perscribed by the program	The findings of student learning in the area of ethical and professional responsibilities was extremely obvious since the subject watter really focused specifically on legal opinion. This course is mianly taught by adjunct instructors who have had years of legal experience. While the instructors do an excellent job in delivery of the subject material and knowledge of the industry need the instructor's could be given some trainging in the use of educational tools such case study evaluation and preparation of better defined assessment rubrics.
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Comments on part I:

As both of the SLOs assessed during the 2019-20 cycle exceed the expected achievement level, we will discuss the feasibility of raising the 'expected achievement level' in the upcoming faculty meeting. The ability to secure a new full-time professor in the Construction Management has presented the new revitalized look at student industry necessary skills. The faculty conversations have obviously been elevated and after analysis of the data obtained from this assessment cycle a revised look at the outcomes will be forth coming.

II. Closing the Loop. Describe at least one data-informed change to your curriculum during the 2017-2018 cycle. These are those that were based on, or implemented to address, the results of assessment from previous cycles.

A. What SLO(s) did you address? Please include the outcome(s) verbatim from the assessment plan.	B. When was this SLO last assessed to generate the data which informed the change? Please indicate the semester and year.	C. What were the recommendations for change from the previous assessment?	D. How were the recommendations for change acted upon?	E. What were the results of the changes? If the changes were not effective, what are the next steps or the new recommendations?
Outcome 5- Communicate effectively regarding subjects related to construction activities	AY 2018/19	<input type="checkbox"/> Investigate the timing of the course as well as the possibility of offering a recourse such as a senior seminar course.	The CM faculty has begun introducing presentation excercises within numerous classes including a stronger emphasis in the senior project. The faculty are also working with the competition teams from the Associated Schools of Construction to develop a presentation that will be used in all classes.	Most instructors reported an obvious increase in presentation skills and comfort. The directed effort to develop an ability to communicate findings without hesitation. Building confidence early on in lower level classes seems to be making a positive impact.

Comments on part II:

The Construction Management Program during this academic cycle worked to solidify instructors within the program. The Spring semester sponsored two faculty searches. At the time of this report a full time tenure track assistant professor is being offered a position while an visiting assistant position is also being considered. Solidification of the faculty will help in the consistency of the future analysis student learning outcomes and program learning objectives. Additionally the department chair surveyed the adjunct faculty of their knowledge of the course specific student learning outcomes. While this assessment is still ongoing 100% of the adjunct faculty report to understand and met the instruction of the outcome objectives during the past semester. Of the reporting faculty 50% report to have exceeded the instructional requirements of the student learning outcomes.

Construction Management Assessment Report- Examples

Academic Year 19/20

Course: CM 475- Senior Project- Spring 2020

Professor: Mincic

Specific Assessment- SLO- Outcome #2

Select and apply the knowledge of mathematics, science and technology to construction problems.

Assessment findings:

The CM 475 is a one semester course in which the students as a team are required to identify their capstone project's; scope of work, deliverables, details, required data collection and communications with the client. This assessment looked at 4 senior projects for the use of mathematics within the project. All projects contained a strong amount of mathematics in determining construction related costs. All of the projects were preconstruction planning and estimating. Mathematical activities mainly focused around determining quantity of materials or services from construction docs or in field determination. Computation of projected costs were presented in the final report documents.

Assessment Samples:

90% of 100% of the students completed the final projects within the targeted standard (75% or better), which included an instructional series on the concept of a sustainable environment for the civil engineering profession, professionals and end users. The final project includes research and analysis ending with the preparation and presentation of a self-chosen construction-related project. The student project and presentations are assessed using the standard CET/CM project and presentation rubric.

The following is a snip from one of the projects demonstrating computational analysis:

The following 4 slides are directly from one team's analysis of the project prior to determining projected construction costs.



ART/MUSIC BUILDING

Colorado State University - Pueblo



- Art/Music Hall was constructed in the early 1970's
- Currently the third worst building on the CSU-Pueblo campus

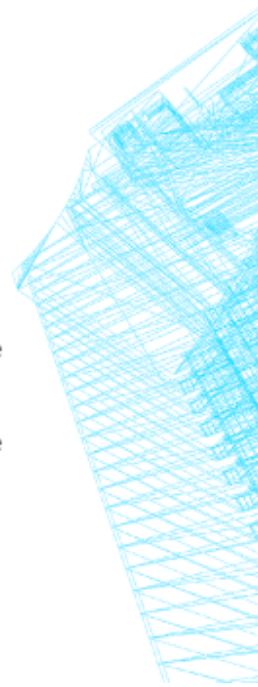


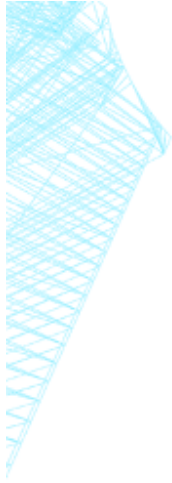
POTENTIAL PROBLEMS

- The test bores revealed that there was mixture of lean sandy clay and clayey sand.
- It is known that this region of southern Colorado contains lots of clay and clayey soils, specifically bentonite clay which is a very expansive material.
- In other words, there is a very high swell potential in this soil.
- There was water found in some of the test bores, so temporary casing and or dewatering may need to take place as piers are drilled.

PROPOSED SOLUTIONS (1/2)

- first recommendation is that the minimum deadload should be at least 20,000psf.
- If the strength requirements cannot be reached, you should extend the length of the pier well into the bedrock.
- In fact, the piers should have a minimum penetration of 8 feet into the bedrock and an overall pier length of 25 feet.





PROPOSED SOLUTIONS (2/2)

- The piers should be reinforced their entire length to withstand swelling pressures of at least 90 kips.
- Because of the possibility of water tampering with pier construction, concrete should be poured as soon as the piers themselves are drilled out

This slide is directly from the report defining cost analysis:

**Clear As Mud Construction
CSU-Pueblo
Art/Music Addition & Improvements**

Audio Visual: The black box is to contain upgraded audio visual equipment including, but not limited to: wireless projectors, speakers, telecommunication, and controls for said devices.

Emergency Systems: The fire alarm system is to tie into the main fire system at Hoag Hall, however shall annunciate independently.

Utility System: Utility systems are to be serviced by Pueblo Water and Black Hills Energy, respectively. The systems shall be upgraded as the design team sees fit to meet the needs of the updated facility. Energy savings and LEED certification shall be considered as the design of intent of the facility.

Theater Support Space: While the black box is the center piece of the structure, no facility is complete without accommodations for maintenance, storage, and other back-of-house operations. The structure shall incorporate floor space for storage of instruments, (foldable) bleacher seating, as well as floor space to house typical building MEP services.

HVAC: The Black Box shall include a hydronic piped mechanical system serviced by the schools on-campus central plant. All controls and automation equipment shall be installed in the building but maintain controllability from the school's facility's office. All air handlers, chillers, and other cooling equipment shall be installed on the rooftop so as not to be viewed in plain site at ground level. Mechanical design shall also include specifications for sound reduction as the facility is used for music production and studying.

8.4 Cost Estimate

This project incorporates new space on the east side of Hoag Hall on the Colorado State University – Pueblo campus as well as renovations to the existing building. Current costs per square foot to build new academic space are currently between \$425 and \$450 according to RS Means. The final extent of the renovation will greatly influence the final cost of construction. Site surveys and investigation report costs are elevated from normal construction costs to account for containing material in the existing building and to account for the inherently troubling soils commonly seen through the campus.

8.5 Financial Explanation

The projected cost is roughly \$4,100,000 to CSU-Pueblo. It is inclusive of all activities on the schedule. Of course this is subject to over time and agreed upon additions and subtractions from original scope.

9. Preliminary Schedule

9.1 Key Dates

- Assumes project is approved in April 2021
- Design Period/Production of Construction Documents: May 2021-June 2021
- Notice to Proceed for Submittals: 6/30/2021
- Notice to Proceed: 7/26/2021
- Hoag Hall Selective Demolition Completion: 8/18/2021
- Superstructure Completion (Topping Out): 10/25/2021
- Bridge/Entryway Completion: 11/11/2021

Academic Year 19/20

Course: CM 461- Construction Law- Fall 2019

Professor: West, Kenneth

Specific Assessment- SLO- Outcome #6

Outcome 6- Demonstrate an understanding of professional and ethical responsibilities

Assessment Sample:

77.81 of 100% of the students completed the learning module which included an instructional series on the concept of a ethics in civil engineering. The students were exposed to various the concepts of ethical practice of civil engineers as published by the American Society of Civil Engineers (ASCE). The module includes research and analysis of various case studies ending with the team preparation and presentation of a self-chosen Case Assessment (See Below). The team is given the “Code of Ethics for the practice of Civil Engineering” along with the accompanying canons and subcanons as published by ASCE. The team is then expected to assess the case against the expected norm and determine if the scenario was ethical and if not how does the situation align with the ASCE standards. The student teams are assessed using the standard CET project and presentation rubric.

Note: This year the professor gave a pretest of the ethics information to determine the classes level of exposure to the subject matter prior to beginning the lecture series. After a dismal rate of less than 30% and an admission by students that they were just guessing, the pretest score was not considered. However the results did reaffirm the need of integration of the topic and awareness of the importance in the Civil Engineering career field was overwhelming. The results shown do reflect asking the questions in the final exam.

Sample Project –CM 461- Construction Law

Option #1: Pros and Cons of Sole Proprietorship vs. Other Legal Structures

Perform an analysis of at least two forms of doing business—one should be a sole proprietorship and the second can be any of the other forms (LLC, LLP, S-Corporation, C-Corporation, for example). Compare and contrast the forms of doing business by setting up a table using Microsoft Word that shows the key features and differences of each form. Following your table, provide a narrative that explains the features of each form of doing business, the pros and cons of each form, and examples of when you may choose one form over the other.

Your paper should be 2-4 pages in length. You are required to support your paper with at least two scholarly sources from the [CSU-Pueblo Online Library](#). The paper must be formatted according to the CSU-Pueblo Online writing and APA standards. (See the [Citation Guide](#) or Purdue [OWL](#) for more information.) Upon completion of this assignment, you will deliver one MS Word file or PDF.

Option #2: Doctrine of Sovereign Immunity

Research the Doctrine of Sovereign Immunity and find a case relating to it. Then write a brief on the case you have chosen. Include a summary of the case including salient information, items that you view as key to consider in the construction business, and the current status or climate as it relates to your chosen case. Your paper should include:

1. A summary of the case, including:
 - o Parties to the case
 - o Facts of the case
 - o Arguments of each party
 - o Relevant case law;
2. Relevant legal concepts as they apply to the module, including definitions/descriptions of legal terms and concepts;
3. The outcome of the case and relevant observations; and,
4. Your opinion on the case and an explanation whether you agree or disagree, and why.

Tips for researching your case:

There are many online resources available to research your case—a good place to begin is in your textbook. Find your topic and see if there are any cases referenced in the end notes. You can review those cases and see if any other case law was referenced in the decision. You should look for key terms within the case and use those for your research.

Your paper should be 2-4 pages in length. You are required to support your paper with at least two scholarly sources from the [CSU-Pueblo Online Library](#). The paper must be formatted according to the CSU-Pueblo Online writing and APA standards. (See the [Citation Guide](#) or the Purdue [OWL](#) for more information.) Upon completion of this assignment, you will deliver one MS Word file or PDF.

Fall 2019

Throughout the semester the students are introduced to 8 intensive modules of instruction related to the Laws effecting the construction industry. Students are given written exams, critical thinking problems, group projects, discussion exercises to ensure the subject competence. The student understanding of ethical issues are extremely prevalent in the course and the following scores results represent the course as a whole. This example represents one of the critical thinking modules in which the student is expected to study the case law and then report an opinion report to present written or orally.