

Continuous Improvement Actions – August 2020 Update

Upon graduation from the Del E. Webb School of Construction (DEWSC) construction management program, a graduate shall be able to:

- 1. Create written communications appropriate to the construction discipline.*
- 2. Create oral presentations appropriate to the construction discipline.*
- 3. Create a construction project safety plan.*
- 4. Create construction project cost estimates.*
- 5. Create construction project schedules.*
- 6. Analyze professional decisions based on ethical principles.*
- 7. Analyze construction documents for planning and management of construction processes.*
- 8. Analyze methods, materials, and equipment used to construct projects.*
- 9. Apply construction management skills as a member of a multidisciplinary team.*
- 10. Apply electronic-based technology to manage the construction process.*
- 11. Apply basic surveying techniques for construction layout and control.*
- 12. Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.*
- 13. Understand construction risk management.*
- 14. Understand construction accounting and cost control.*
- 15. Understand construction quality assurance and control.*
- 16. Understand construction project control processes.*
- 17. Understand the legal implications of contract, common, and regulatory law to manage a construction project.*
- 18. Understand the basic principles of sustainable construction.*
- 19. Understand the basic principles of structural behavior.*
- 20. Understand the basic principles of mechanical, electrical and piping systems.*

DEWSC faculty annually measure the ability of each student for each of the learning outcomes listed above. Each August, the faculty review the results of the measures, as well as the results of the senior exit surveys, where each student ranks their own ability in each of the 20 outcomes. This document summarizes our evaluation of the student assessments in these areas, and actions taken to ensure students are attaining the set thresholds.

This process is part of our continuous improvement; measures, outcomes, assessment tools, and procedures can be changed to improve student learning.

The direct assessment is the percent of students achieving a 70% or better on the assessment tool. The second, indirect assessment, is the average students rating of their own ability to do the SLO on a 1 – 7 scale. As per our Quality Improvement Plan, our action threshold is 70% for the direct assessment, and 5.0 for the Exit Survey.

August 19, 2020 – DEWSC Annual Assurance of Learning Faculty Meeting

ALL Courses – Decisions/Discussion

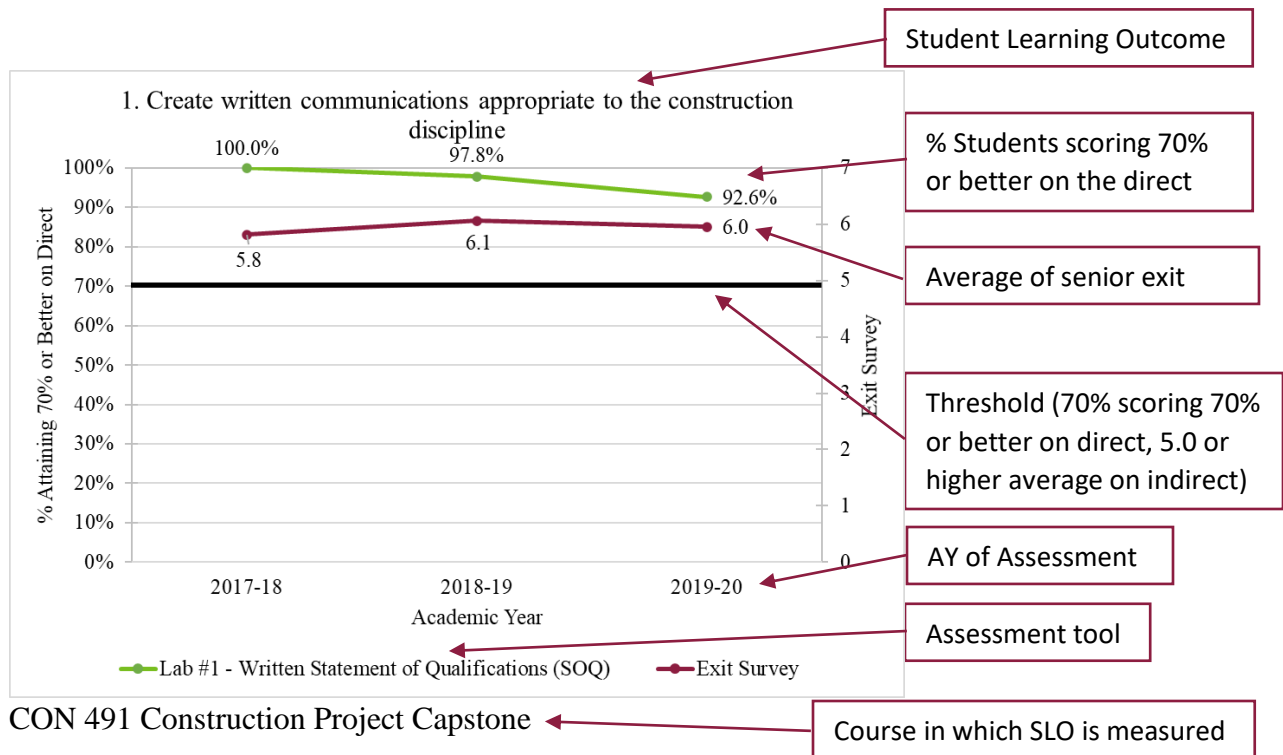
- **Do we want to move SLO Assessments to full-time instructor courses? (discussion AFTER individual SLO discussions)**
- **We select faculty associates based on domain expertise; they understand the industry needs. Leave measurements as-is in their classes.**

August 21, 2019 – DEWSC Annual Assurance of Learning Faculty Meeting

August 15, 2018 – DEWSC Annual Assurance of Learning Faculty Meeting

ALL Courses – Decisions/Discussion

- A. Review course-learning outcomes at the beginning and again toward the end of each course, preferably before the final.
- B. Consider revising the senior exit interview to explain the levels of Bloom's, so the students are assessing themselves at the right level.



Action to improve or maintain (Aug 2020, for 2020-2021):

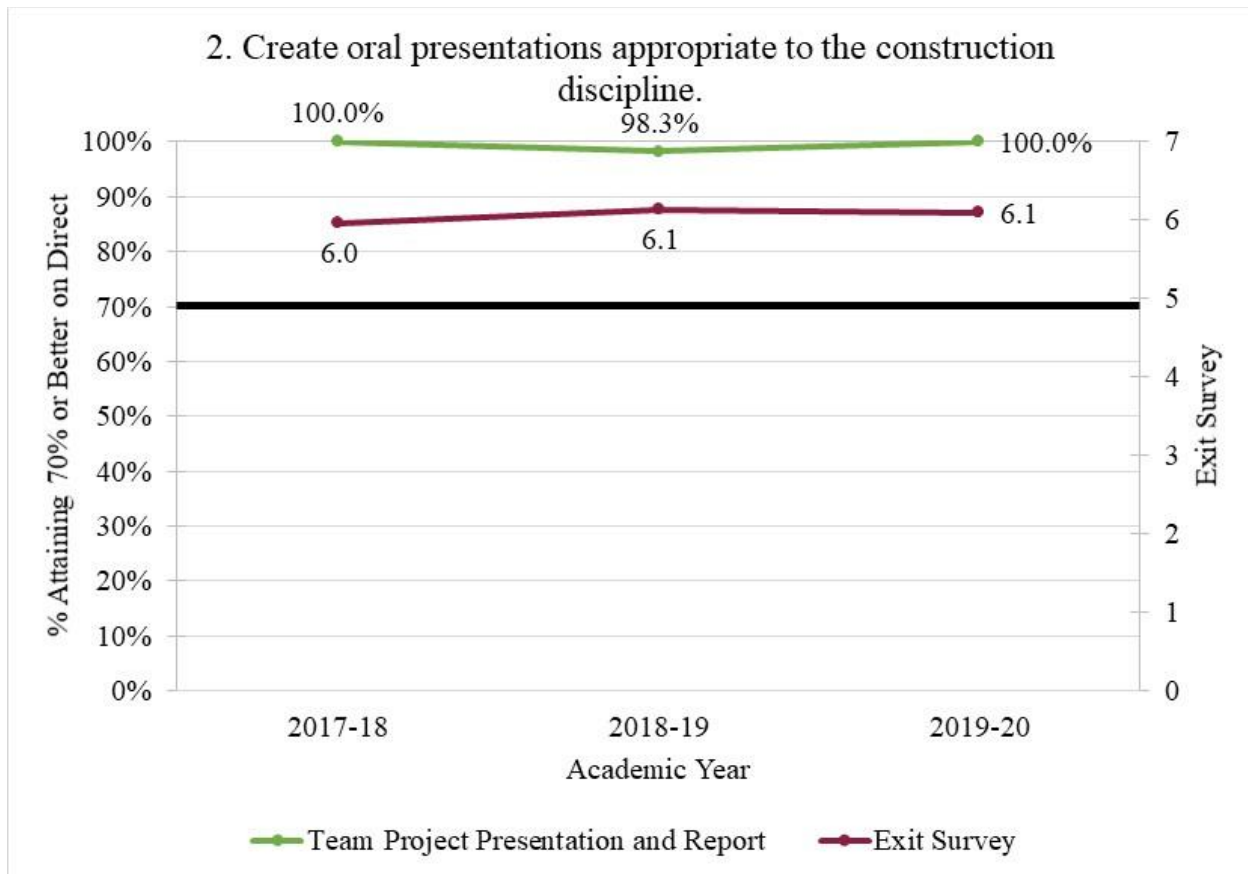
- Downward trend was reflective of the course becoming required. 17-18 it was an elective and chosen by over-achievers.
- Will engage design industry in the grading of the assessment tool.

ALSO: ABET Performance Indicator for SO #4 An ability to communicate effectively with a range of audiences. Used with SLO #2. Together, do they (CAN THEY) MEET ALL PARTS? Design industry will be included in the evaluation of the assessment tool, to reinforce the “range of audiences” part of this measurement.

Previous actions to improve or maintain:

Continue to assess (2019-2020)

- Continue to collect data with larger capstone class size (2018-2019)



CON 455 Project Management

Action to improve or maintain (Aug 2020, for 2020-2021):

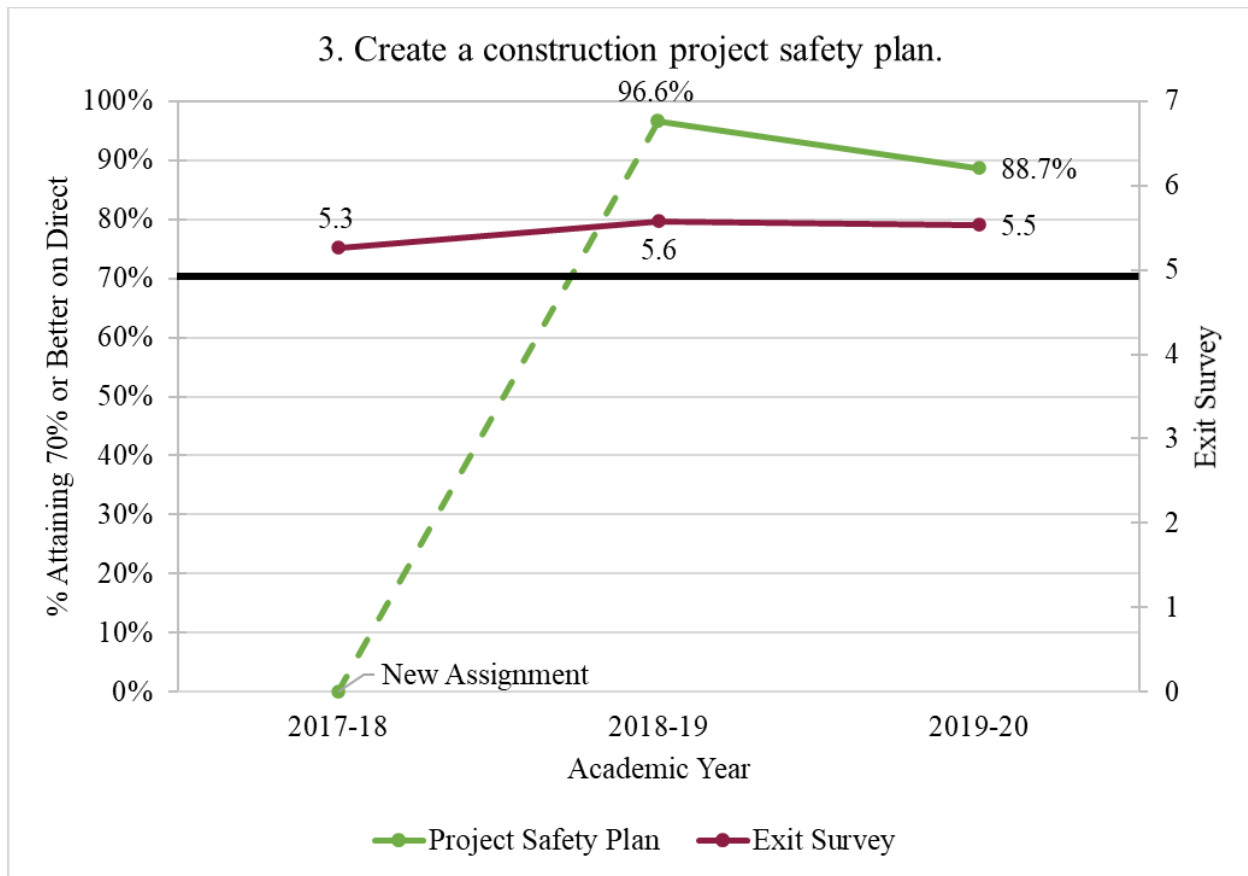
- Continue to have the students do individual presentations.
- Ensure the students continue to do oral presentations at the lower division classes to perform well here.

ALSO: ABET Performance Indicator for SO #4 An ability to communicate effectively with a range of audiences. Used with SLO #1. Together, do they (CAN THEY) MEET ALL PARTS? Speaking to CON and CNE students helps provide a range of audiences.

Previous actions to improve or maintain:

Continue to measure individual presentations. Continue to measure only presentation portion. (2019-2020)

- Continue to collect data. (2018-19)



CON 491 Construction Project Capstone

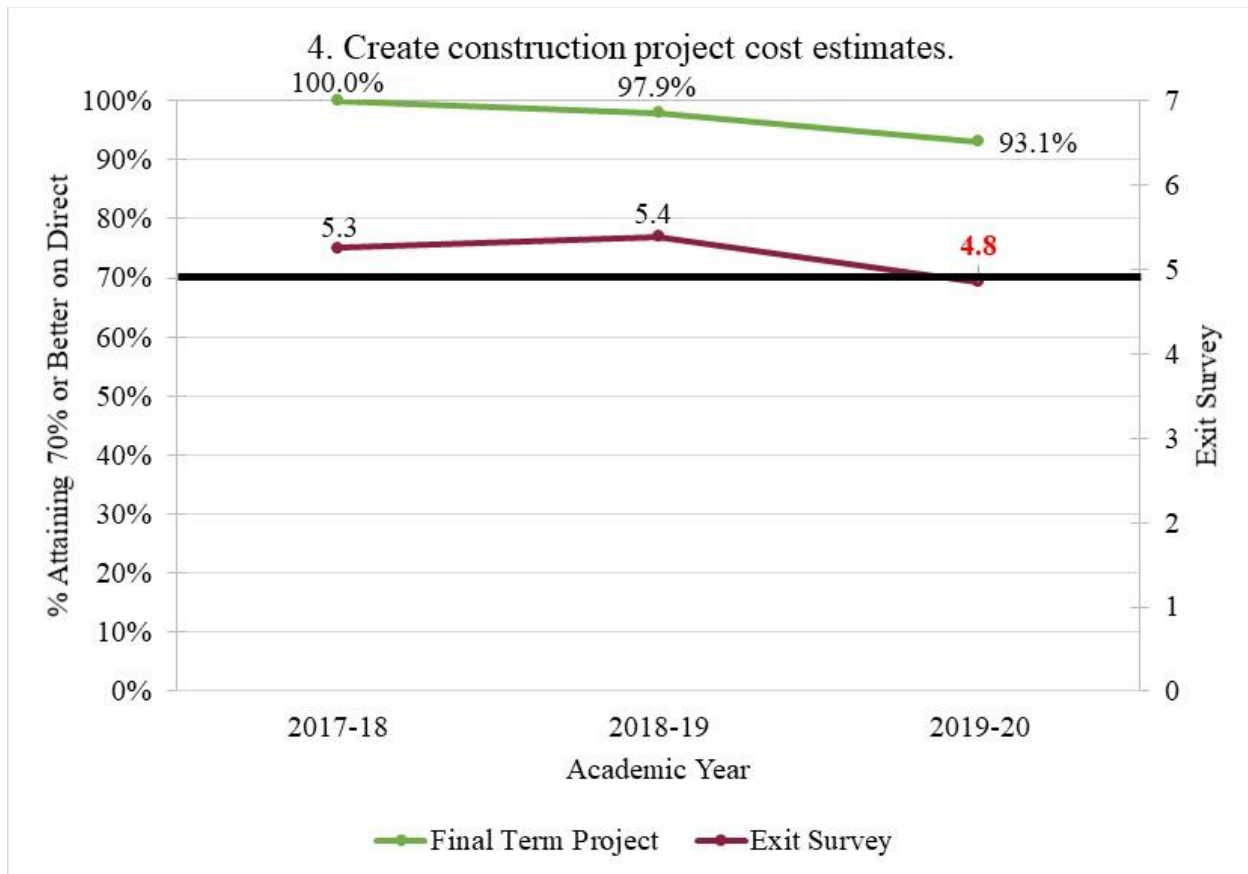
Action to improve or maintain (Aug 2020, for 2020-2021):

- Continue to teach, assign, and assess the students.

Previous actions to improve or maintain:

Tool has been used for a while, just started being used as an SLO assessment tool. (2019-2020)

- Series of labs for preconstruction activities – the safety plan version of this. (2018-2019)
- Students pick one of six projects. Individual deliverable. (2018-2019)



CON 383 Construction Estimating

Action to improve or maintain (Aug 2020, for 2020-2021):

- Groups are too big; the senior exit survey that resulted in 4.8 was from the class that was 110. Using smaller groups now.
- Work leading up to the project was not in the best environment; shifted the class to a better classroom (not a lecture-style setup). 19-20 was better; those students will graduate 20-21.
- Group project, but each student's work is identified and graded for that student.
- Can we include more estimating in other classes between estimating and capstone?

Previous actions to improve or maintain:

All separate/individual grades. Keep on assessing. (2019-2020)

- Large lecture class is broken into additional lab sections limited to 35 students. (2018-2019)
- Labs are real-time assignments with the TA or instructor. (2018-2019)
- Filming solution walk-throughs to be added to the canvas course site. (2018-2019)
- Modified project to be somewhat smaller. (2018-2019)
- Examine other assignments to get an individual assessment instead of a group assessment. (2018-2019)



CON 495 Construction Planning and Scheduling

Action to improve or maintain (Aug 2020, for 2020-2021):

- Continue to emphasize how project planning provides the input for creating the construction project schedule, and how that schedule is used to assist the project management team in the control of project deliverables.

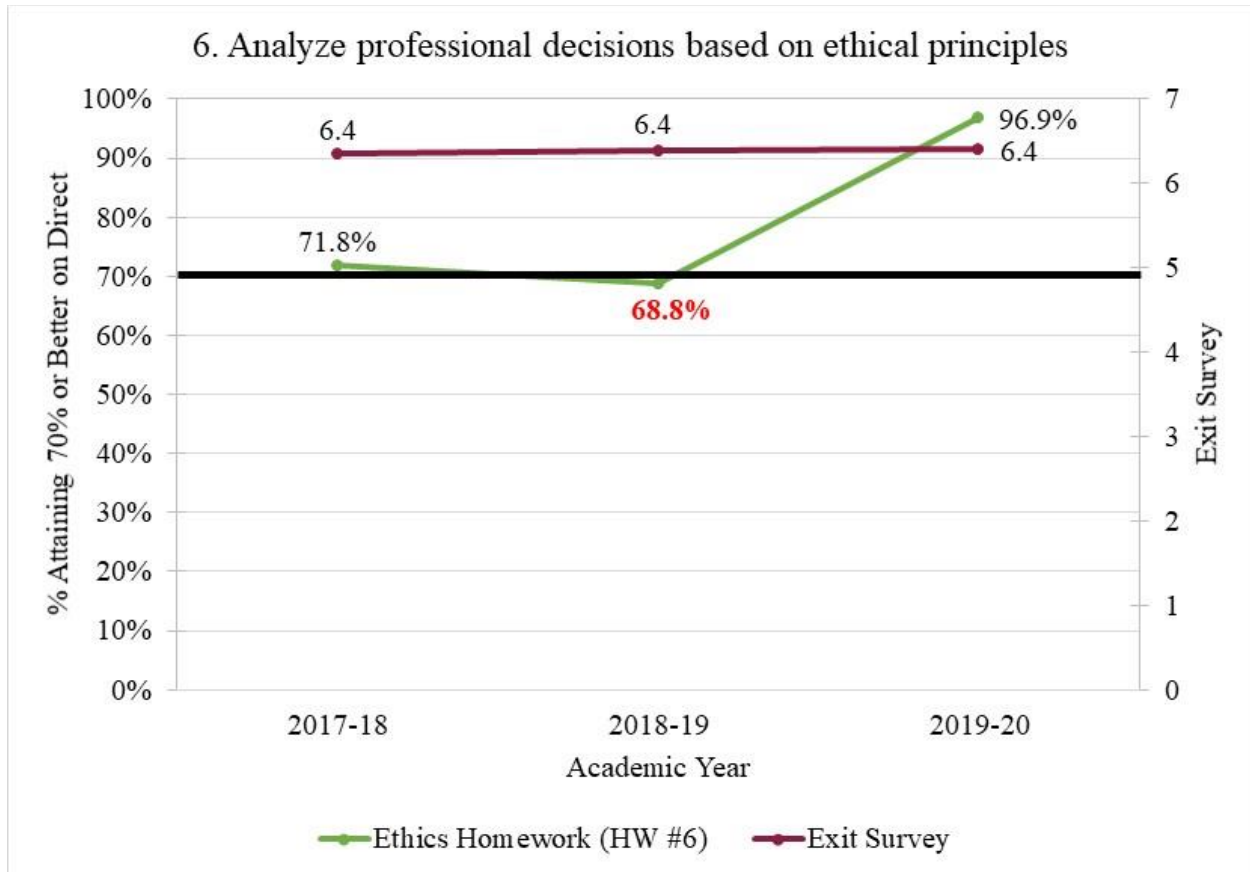
Previous actions to improve or maintain:

Add a follow up question in the exit interview why they feel poorly. (2019-2020)

Continue with the two previous items (improve feedback and review learning outcomes). (2019-2020)

Clarifying that it's ability to create schedule versus using the software. (2019-2020)

- Improve the feedback going to the students on the direct assessment tool. (2018-2019)
- Review course learning outcomes toward the end of the course. (2018-2019)



CON 271 Construction Safety

Action to improve or maintain (Aug 2020, for 2020-2021):

- All students do the assignment now, as it is worth a lot more.
- Keep doing the assignment; rubric will change to better measure the content and not grammar/writing/etc.
- Will add a checklist section to rubric for the ABET parts. (Tony to send ABET info to Rich)
- If Rich can't, see if we can cover in CON 448.

ALSO: ABET Performance Indicator for SO #5 An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts. MEETS ALL PARTS?

Will add a checklist into the rubric to ensure each student addresses all parts:

- Ethical responsibilities
- Professional responsibilities
- Technical/scientific solutions
- Global context
- Economic context
- Environmental context
- Societal context

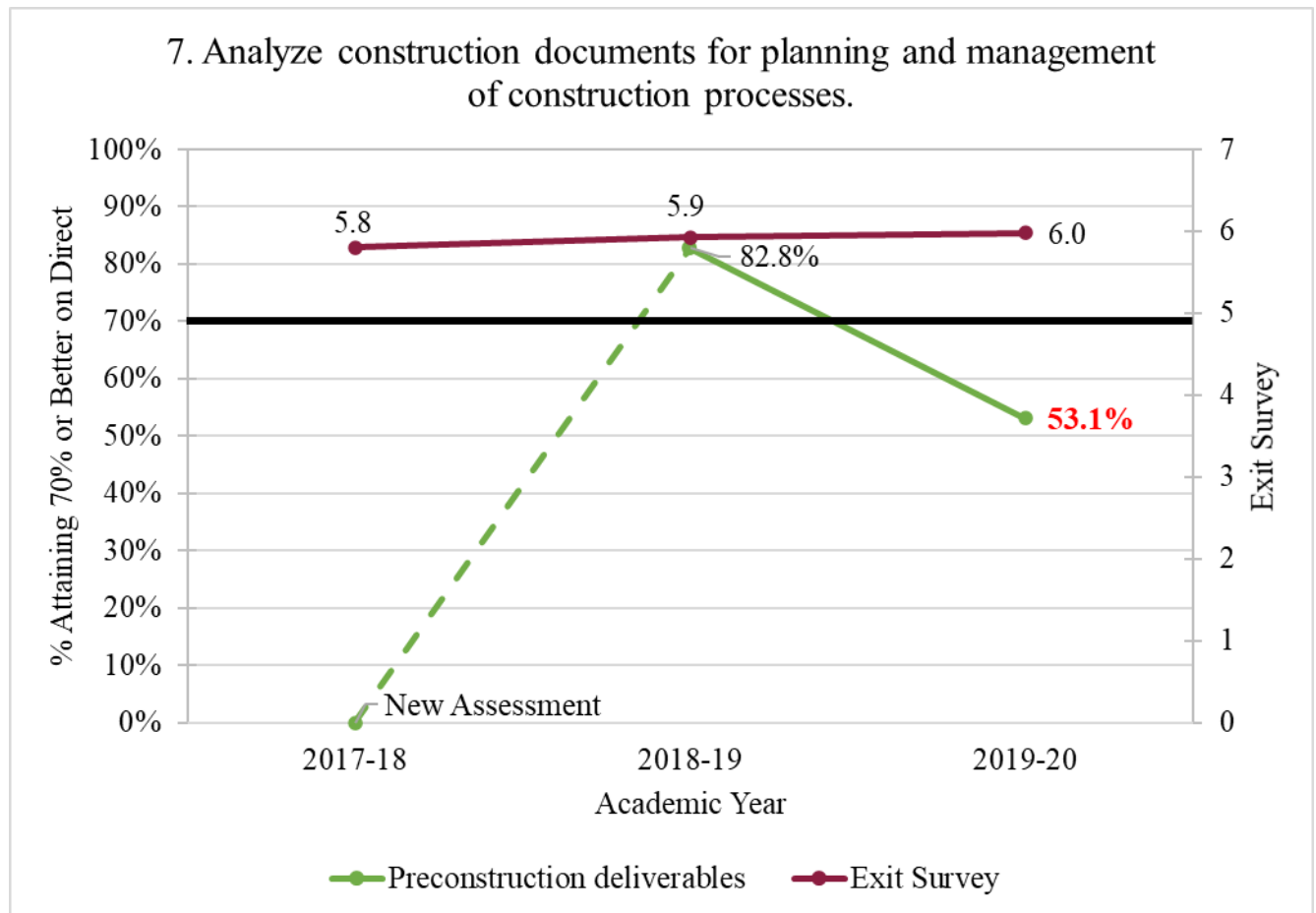
Previous actions to improve or maintain:

Moved earlier. Low % is from a lot of no-turn-ins from the fall semester before the move to earlier in the course was made. Spring semester was at about 75%. (2019-2020)

Continue with it earlier in the semester. (2019-2020)

Will make the assignment worth more (Make it hurt if it's not turned in). (2019-2020)

- Written assignment toward the end of course; students may blow it off since it is only 10 points. (2018-2019)
- Try moving it earlier in the course. (2018-2019)



CON 491 Construction Project Capstone

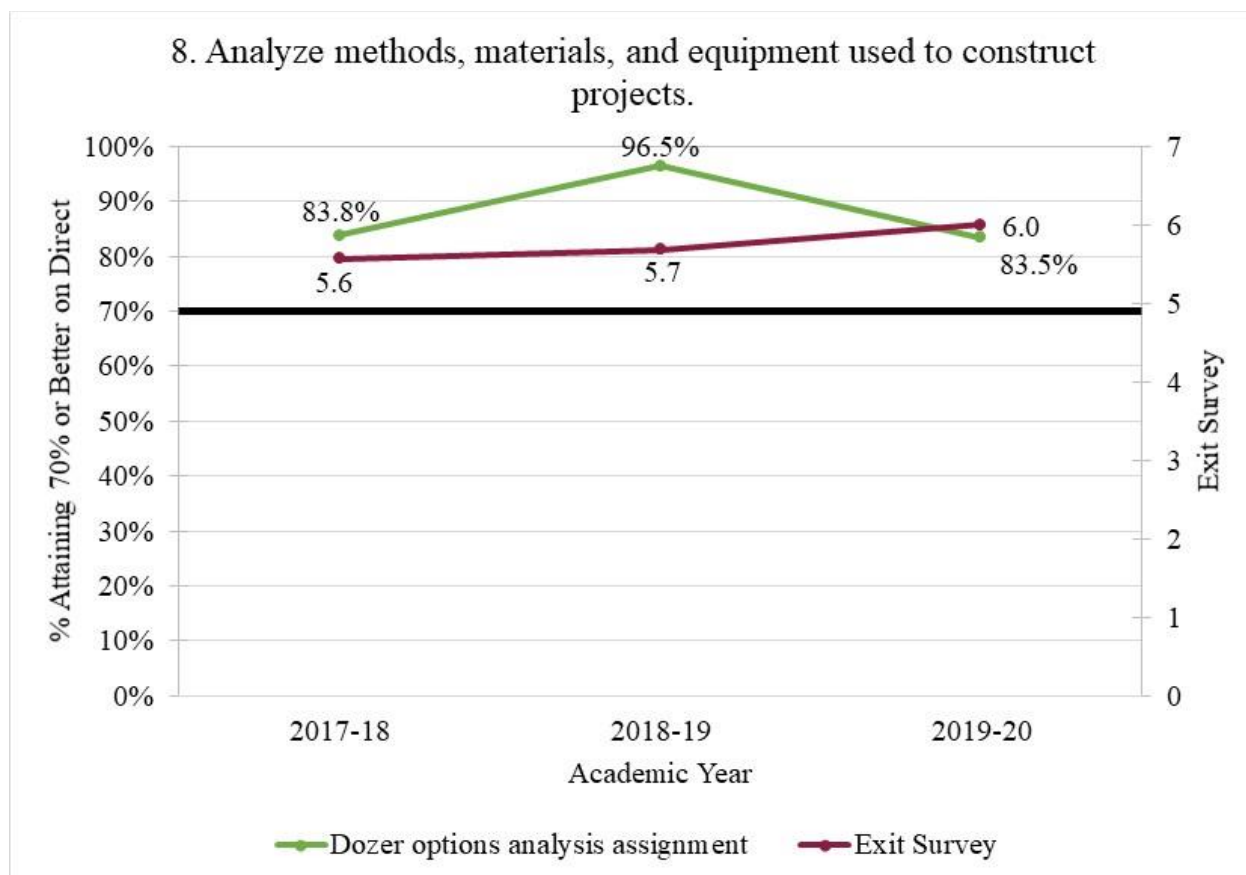
Action to improve or maintain (Aug 2020, for 2020-2021):

- Poor response was direct result of COVID and going to a different format; some of the students didn't do the assignment as part of accommodations; assessment tools will be required going forward.

Previous actions to improve or maintain:

Estimate and Schedule (2 labs) of the preconstruction deliverables. Project schedule for selected CSI divisions (students pick 4 divisions and subcontract the rest). (2019-2020)

- Series of labs for preconstruction activities. (2018-2019)
- Students pick one of six projects. Individual deliverable. (2018-2019)



CON 243 Heavy Equipment Methods Materials and Equipment

Action to improve or maintain (Aug 2020, for 2020-2021):

- 96.5 to 83.5 could be explained by shift in assessment tool. Continue to use HW#7.

ALSO: ABET sole Performance Indicator for SO #3 An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions. DOES IT (CAN IT) MEET ALL PARTS?

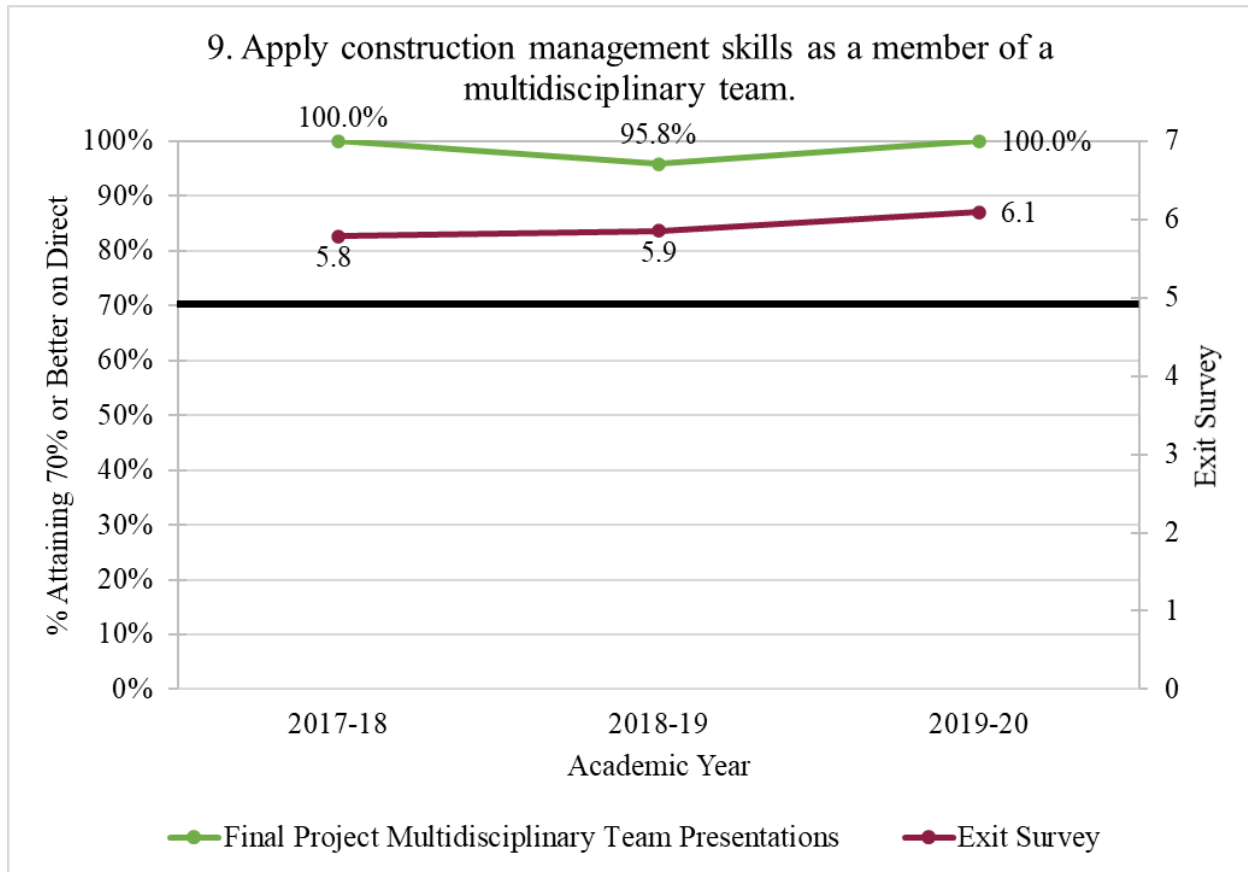
Will add Develop and Test hypothesis to the assessment tool and ensure there is a final conclusion.

Previous actions to improve or maintain:

Works well as a team (for ABET). Currently graded as a team. (2019-2020)

Will use a homework assignment for assessing this SLO. (2019-2020)

- Currently a group project. (2018-2019)
- Look at homework assignments to be more analyze than assess level to replace this assessment tool on an individual basis. (2018-2019)



CON 491 Construction Project Capstone

Action to improve or maintain (Aug 2020, for 2020-2021):

- Assess with same tool; Students develop responsibilities for the different roles.
- Will examine students role playing or working with industry representatives from the different roles. Will ensure the assignment hits all ABET SO #6 parts.

ALSO: ABET Performance Indicator for SO #6 An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty. Used with SLO #8. Together, do they (CAN THEY) MEET ALL PARTS?

Will add a checklist into the rubric to ensure each student addresses all parts:

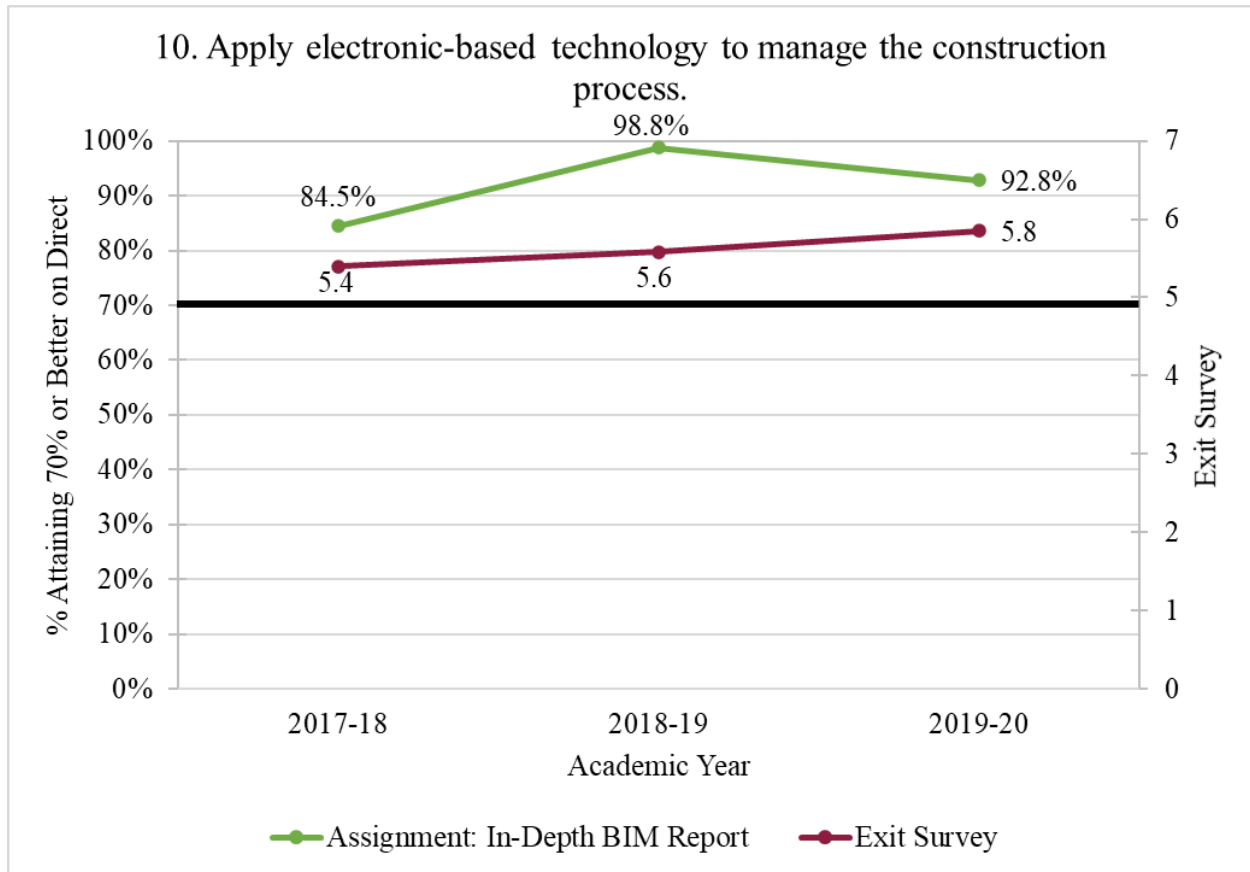
- Function effectively on teams
- Establish goals
- Plan tasks
- Meet deadlines
- Analyze risk and uncertainty

Previous actions to improve or maintain:

Continue as currently assessed. (2019-2020)

Content is assessed, not the presentation skills. (2019-2020)

- Role-playing with owner, designer, contractor (PM, Super, Estimator), and subcontractor. All roles apply construction management skills. Present as a team, each is scored individually. (2018-2019)
- Examine getting a designer to play the role of designer. (2018-2019)
- Examine working with construction engineering students on an assignment for this outcome. (2018-2019)



CON 453 Construction Technology

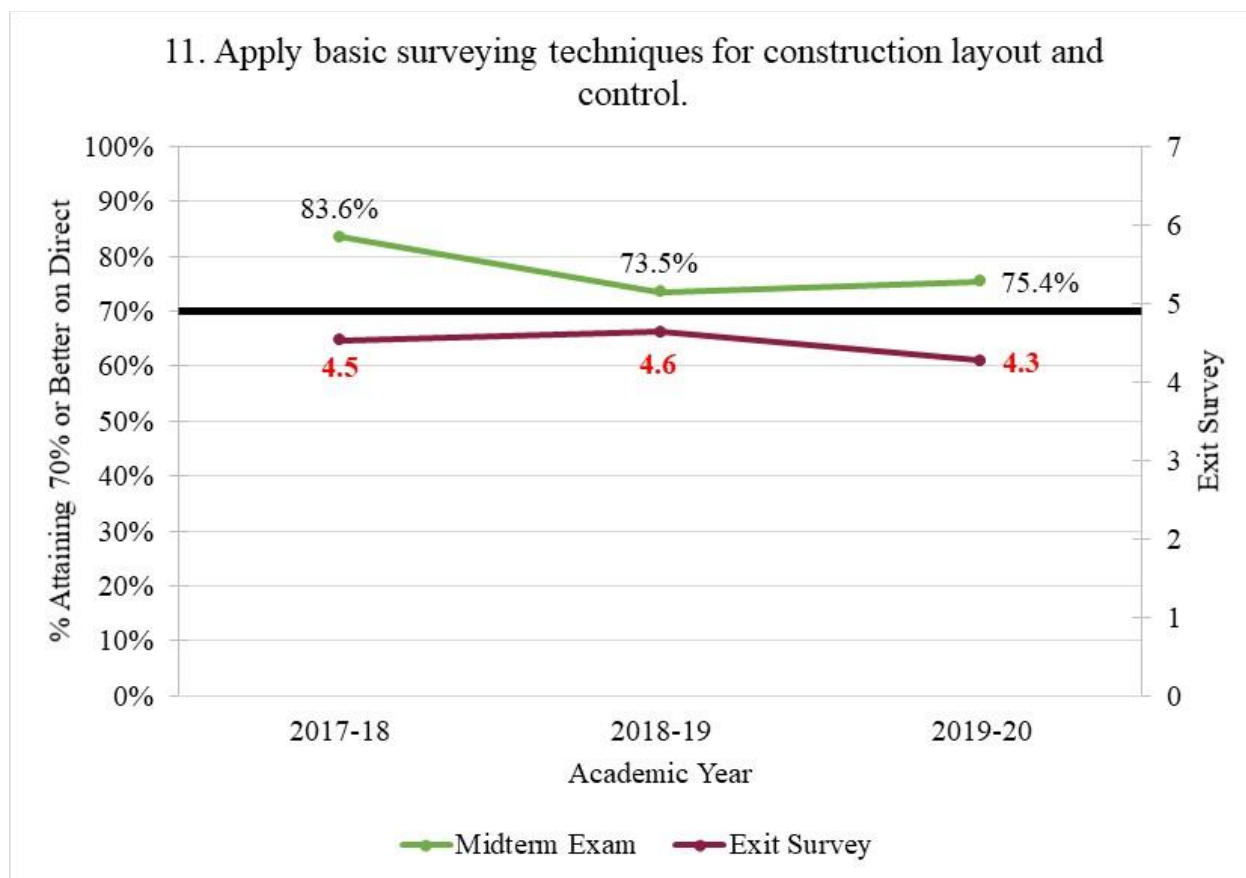
Action to improve or maintain (Aug 2020, for 2020-2021):

- Changes to assessment tool successful.
- More appropriate to measure in CON 251; instructor of 453 will work with instructor of 251. Scheduling and process will be covered before this assessment is used.

Previous actions to improve or maintain:

Changes made; percentage went up as expected. Assignment was made to hold more credit. (2019-2020)

- Individual grade; most who didn't meet the threshold got around a 0. (2018-2019)
- Need to stress the value of this exercise. (2018-2019)
- Switched to an In-Depth BIM Report. (2018-2019)



CON 241 Surveying

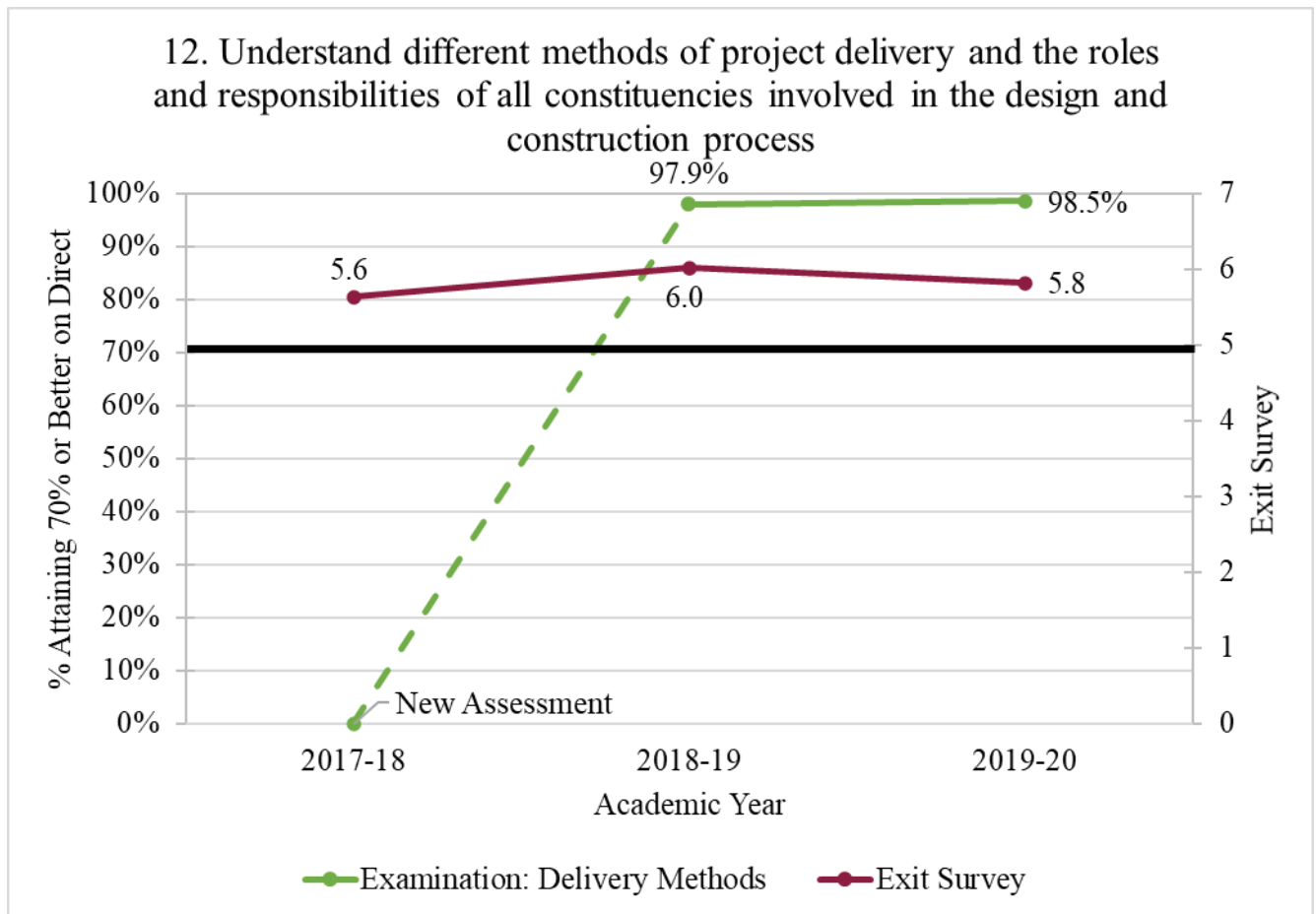
Action to improve or maintain (Aug 2020, for 2020-2021):

- Industry members from Okland Construction are rebuilding the course from the ground up, making it focused on construction.
- Expanding the assessment material available; ultimately would like to assess this SLO in the final.
- The course is situated in the sophomore year, it's likely the Exit Survey will pick up in 1 – 2 years. It will also be good to look at assessment data pairs for the same cohort of students. For example, the 19-20 graduates (4.3 exit survey average) took surveying in 17-18 (83.6% direct measure).

Previous actions to improve or maintain:

Reviewing how surveying is delivered to the students, change in instructor. Don't have an assessment tool in the projects controls course. Continue to assess in CON 241. Switch from Lab to Midterm Exam for the assessment tool. (2019-2020)

- Stressed that it's a high liability course. (2018-2019)
- First half is civil, second half construction. (2018-2019)
- Have students refreshed on SLOs prior to their survey, and a brief explanation of bloom's taxonomy. (2018-2019).



CON 491 Construction Project Capstone

Action to improve or maintain (Aug 2020, for 2020-2021):

- Continue using assessment tool; the owner, designer, contractor as constituencies.

Previous actions to improve or maintain:

Continue. Given twice and seems to be assessing appropriately. "All constituencies" is broad. Search for clarification for how broad these constituencies are/need to be. (2019-2020)

- Newly added. (2018-2019)



CON 496 Construction Contract Administration

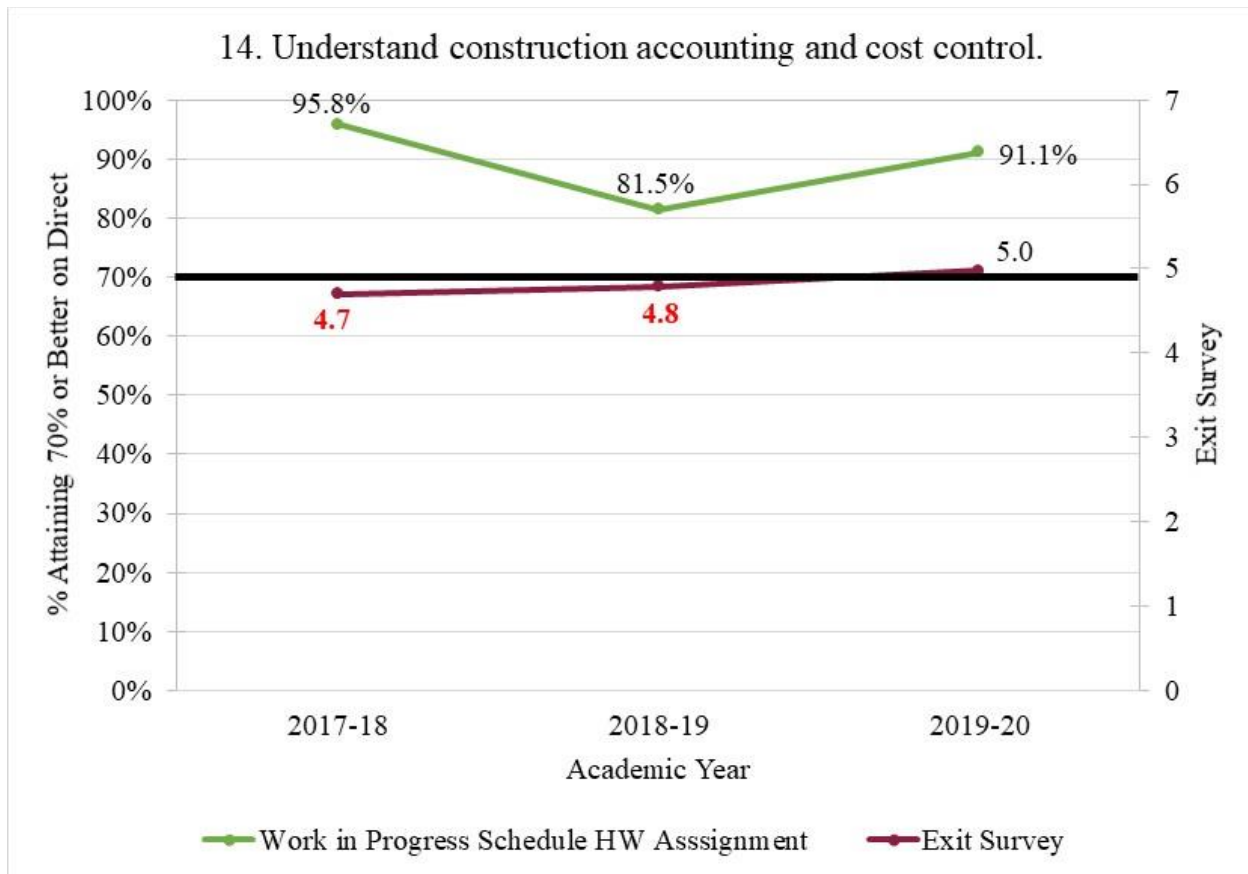
Action to improve or maintain (Aug 2020, for 2020-2021):

- One homework assignment... given fact pattern and must identify risk and explain approach.
- Will separate content grade from form grade.

Previous actions to improve or maintain:

Continue with assessments. (2019-2020)

- Continue assignments. (2018-2019).



CON 487 Project Controls

Action to improve or maintain (Aug 2020, for 2020-2021):

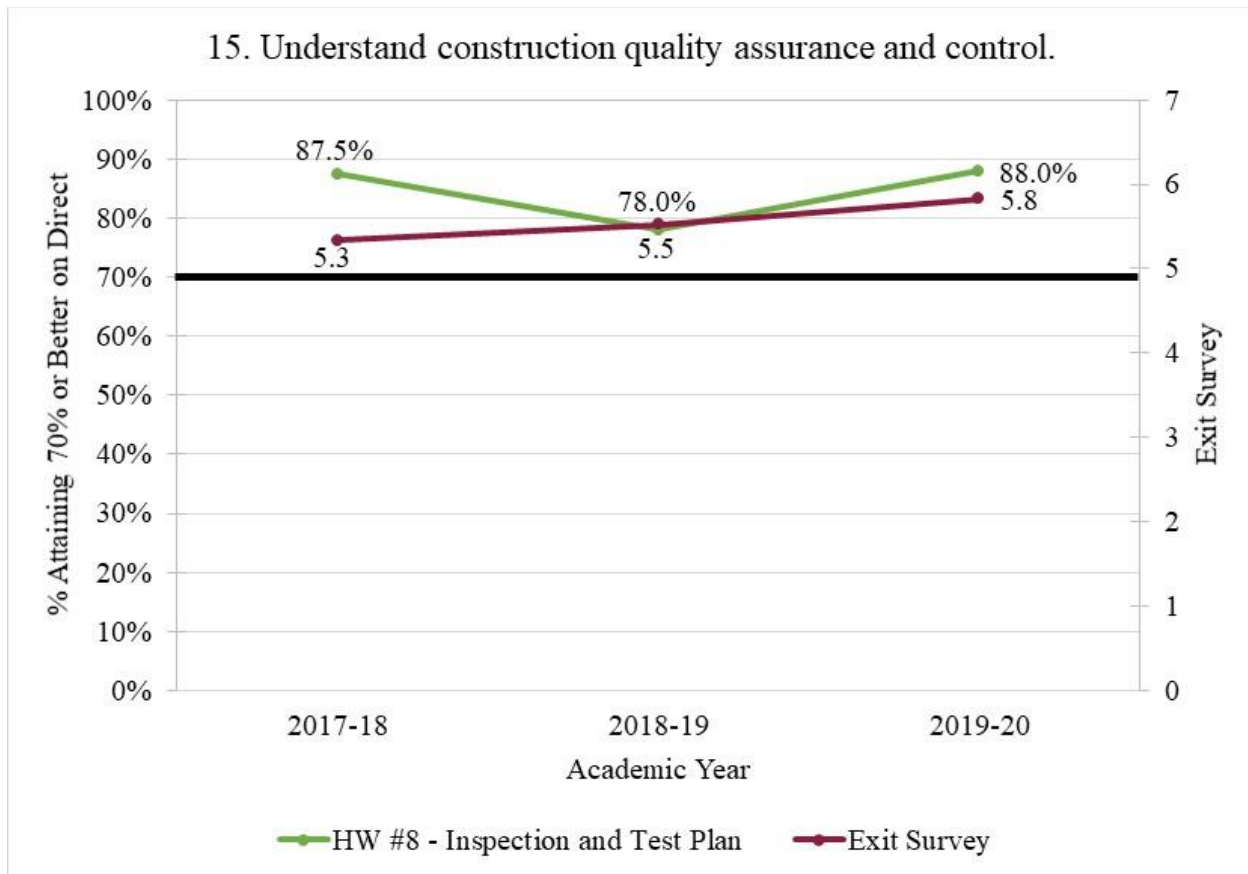
- Work in progress homework assignment in CON 487 Project Controls
- Continue assessing with this tool (past semester was first time).

Previous actions to improve or maintain:

Production one is fine. Believe the question is misleading... add commentary. (2019-2020)

Move this assessment to Project Controls course, create new assessment tool (Work in Progress Assignment. (2019-2020)

- Individual assignments! (2018-2019)
- Surprised it's this high, since it's only 2 assignments. (2018-2019)
- Used to have a course on this one. (2018-2019)
- Understand a cash flow analysis, cover basics of construction accounting. (2018-2019)
- Have students refreshed on SLOs prior to their survey, and a brief explanation of bloom's taxonomy. (2018-2019)



CON 487 Project Controls

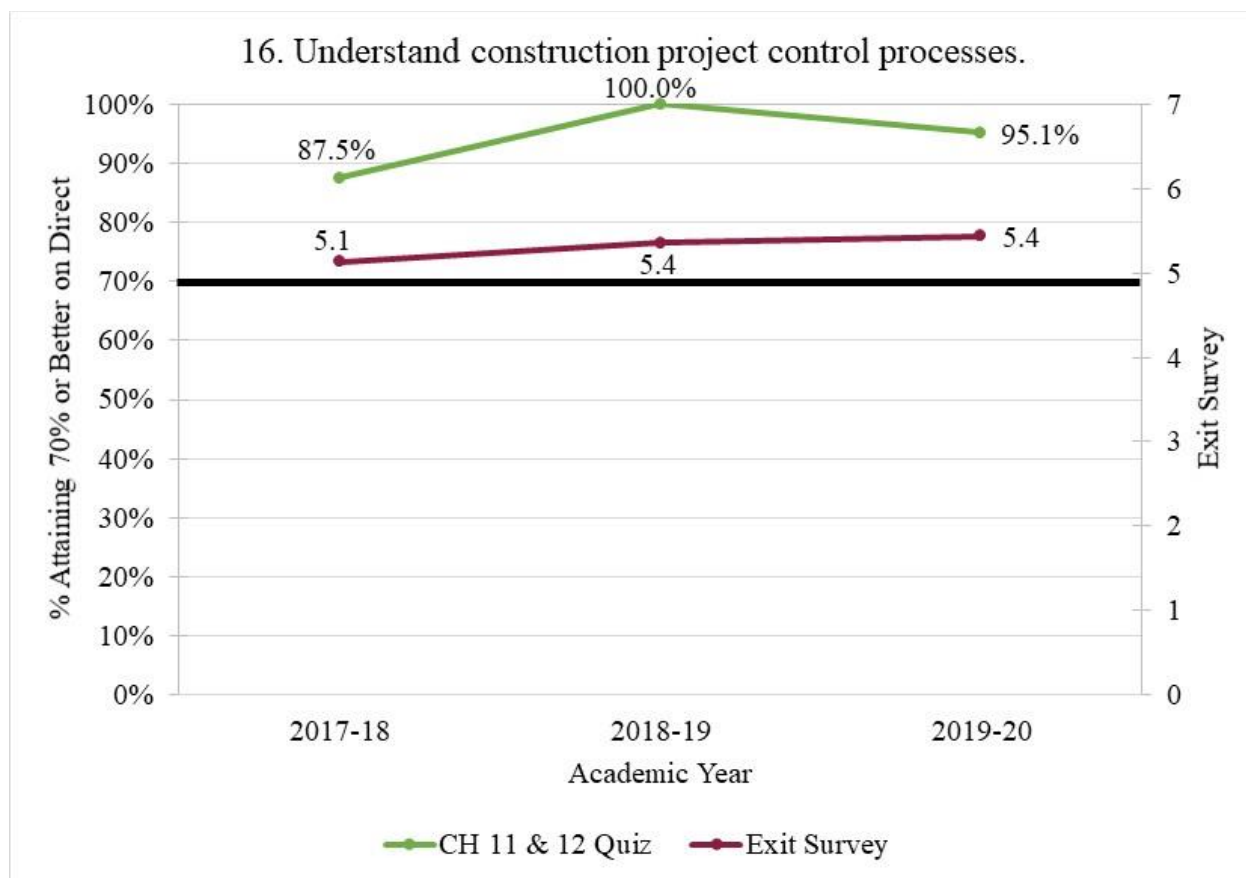
Action to improve or maintain (Aug 2020, for 2020-2021):

- Assessment change seems to be working well.
- Continue to assess and monitor.

Previous actions to improve or maintain:

Continue. Assessment was changed, resulting in the lower direct measure. (2019-2020)

- Standard project management textbook. (2018-2019)
- Understand level homework questions. (2018-2019)
- Will separate out the student performance data from #15 and #16 for these two SLOs. (2018-2019)



CON 487 Project Controls

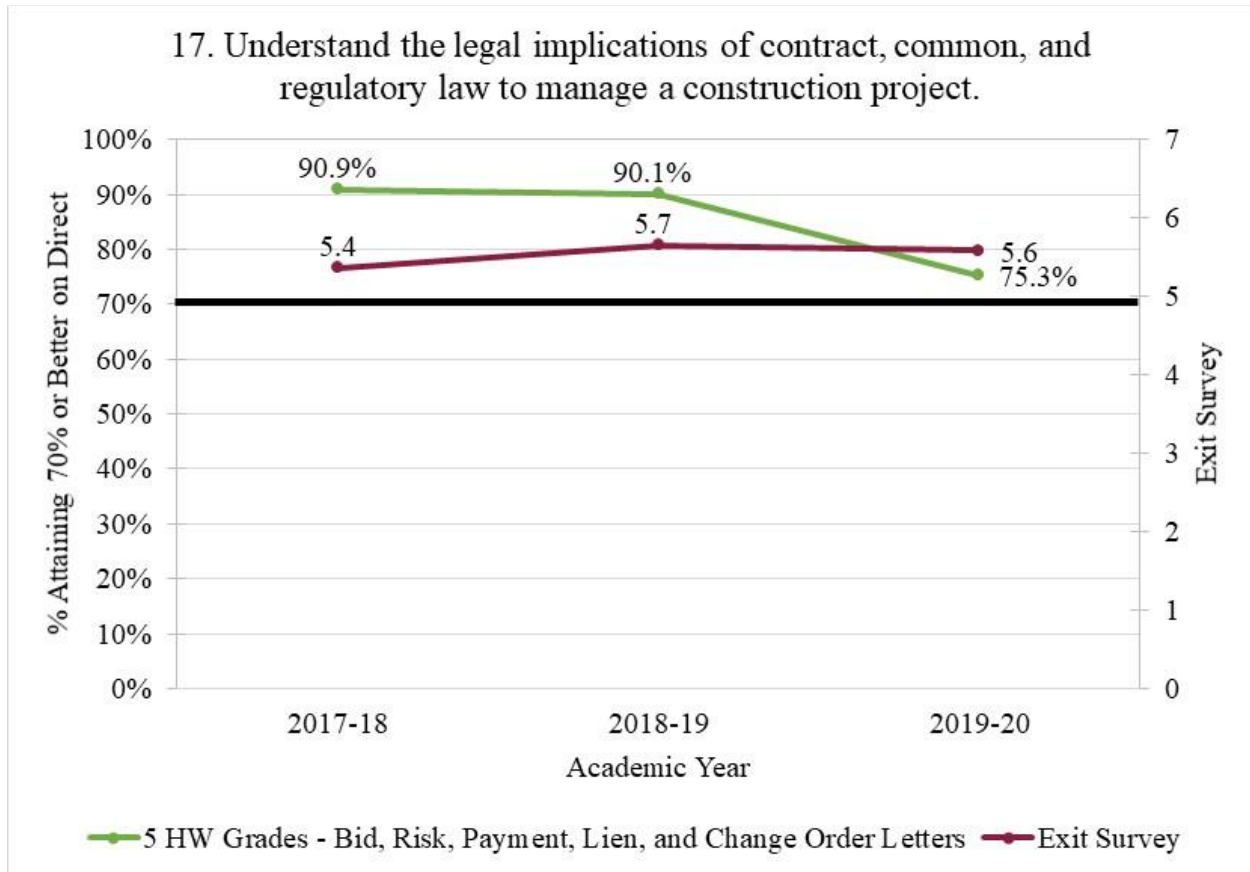
Action to improve or maintain (Aug 2020, for 2020-2021):

- Quiz is sufficient for understand; continue to use.
- Have a comprehensive project, but it is a group project, so how to break out individual? Explore options.

Previous actions to improve or maintain:

Continue to use assessment. (2019-2020)

- Changed to CH 11 & 12 Quiz. (2018-2019)
- Standard project management textbook. (2018-2019)
- Understand level homework questions. (2018-2019)
- Will separate out the student performance data from #15 and #16 for these two SLOs. (2018-2019)



CON 496 Construction Contract Administration

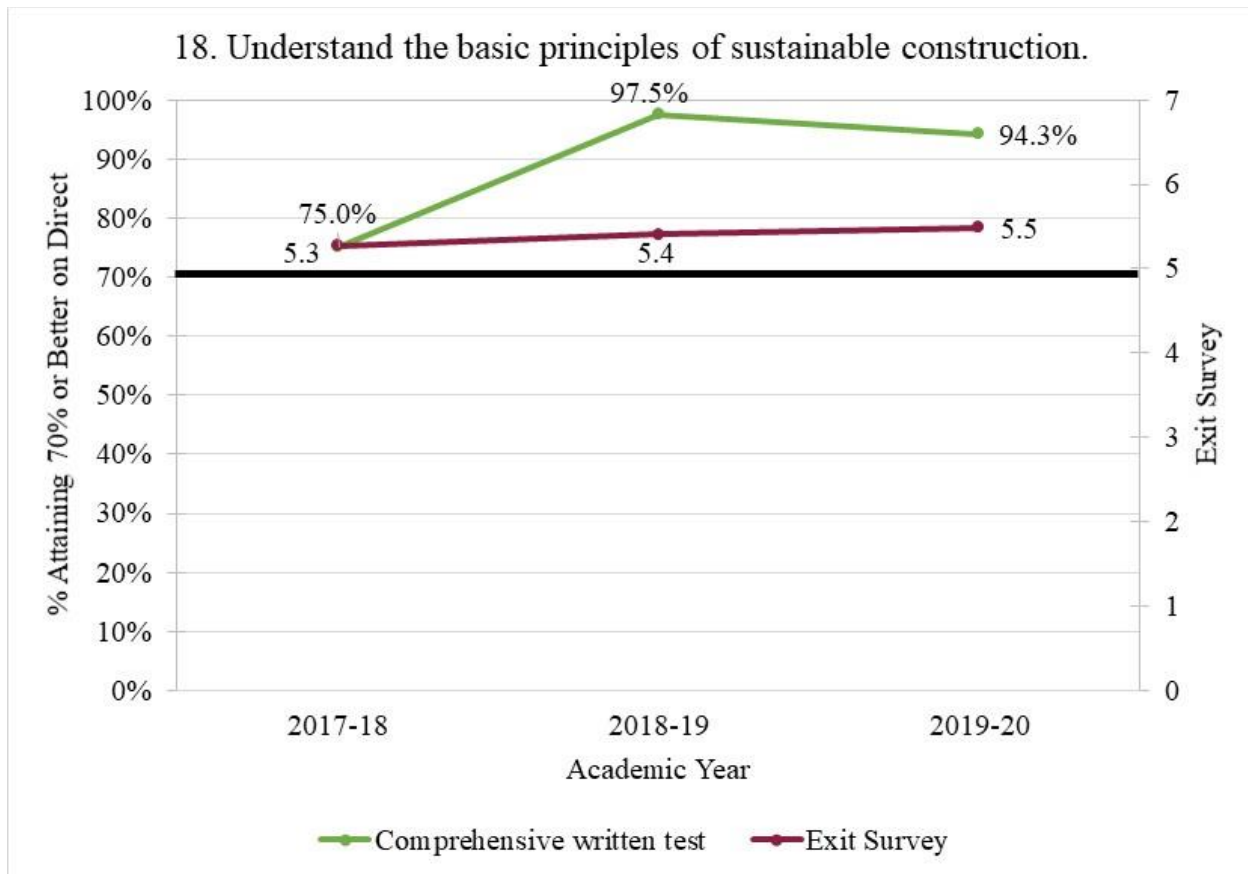
Action to improve or maintain (Aug 2020, for 2020-2021):

- Sum of five homework assignments... given fact pattern and must identify risk and explain approaches, one change order to create.
- Will separate content grade from form grade for all parts.
- Decline was from lots of missed assignments; could be a COVID cause.

Previous actions to improve or maintain:

Continue with assignment (2019-2020)

- Continue. (2018-2019)



CON 448 Sustainable Construction

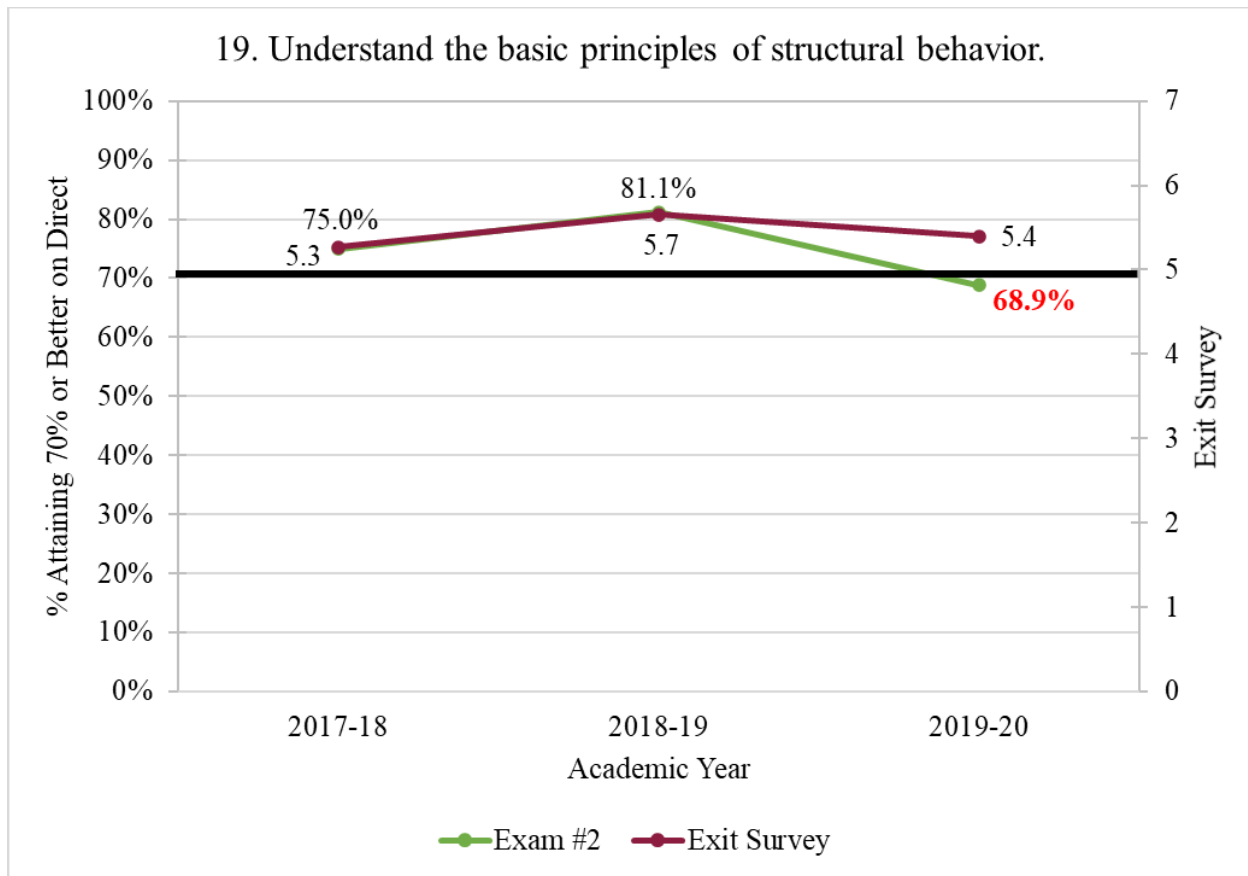
Action to improve or maintain (Aug 2020, for 2020-2021):

- Final comprehensive exam is a good measure; about split between quantitative and qualitative. Continue.

Previous actions to improve or maintain:

Continue. (2019-2020)

- Will be a required class. (2018-2019).
- Cover heat transfer calculations more in depth, to improve student performance on that part of the exam. (2018-2019).



CON 424 Construction Structural Design

Action to improve or maintain (Aug 2020, for 2020-2021):

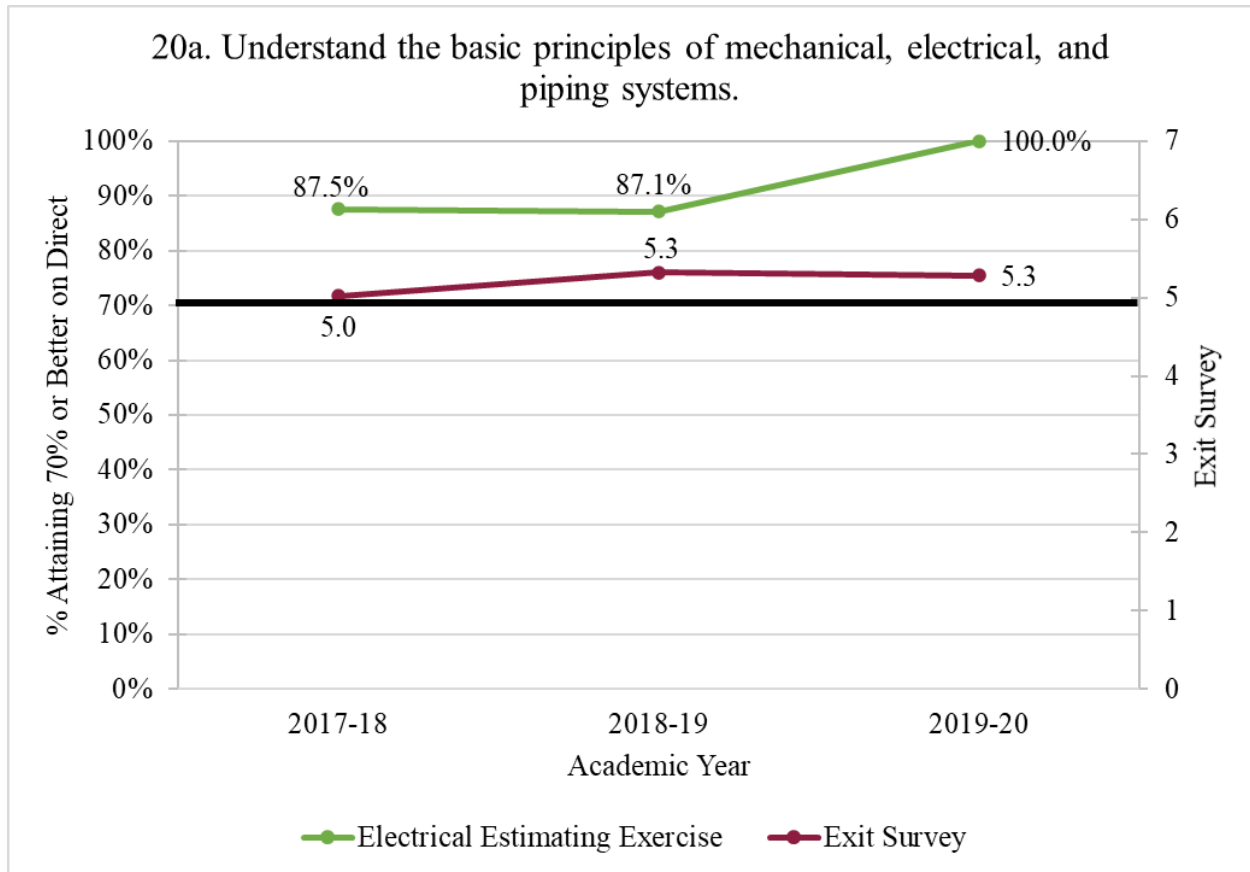
- Exam 2 occurred 3 weeks after the switch to remote instruction via zoom; it was the first online exam the instructor ever created as well as the first online exam the students took in CON 424.
- Weekly online quizzes will be added to adjust students to the types of questions they will experience on the exams.
- Two undergraduate teaching assistants will be used to assist the students in navigating complexities of learning structures via ASU Sync.

Previous actions to improve or maintain:

More emphasis on load paths and load effects seemed to work. (2019-2020)

Change assessment tool from Exam #1 to Exam #2 to eliminate the shock of the first exam and to have more time to cover the behavior of structures. (2019-2020).

- Spend more time on and apply more emphasis on the analysis aspects, on load paths and load effects.



CON 273 Electrical Construction Fundamentals

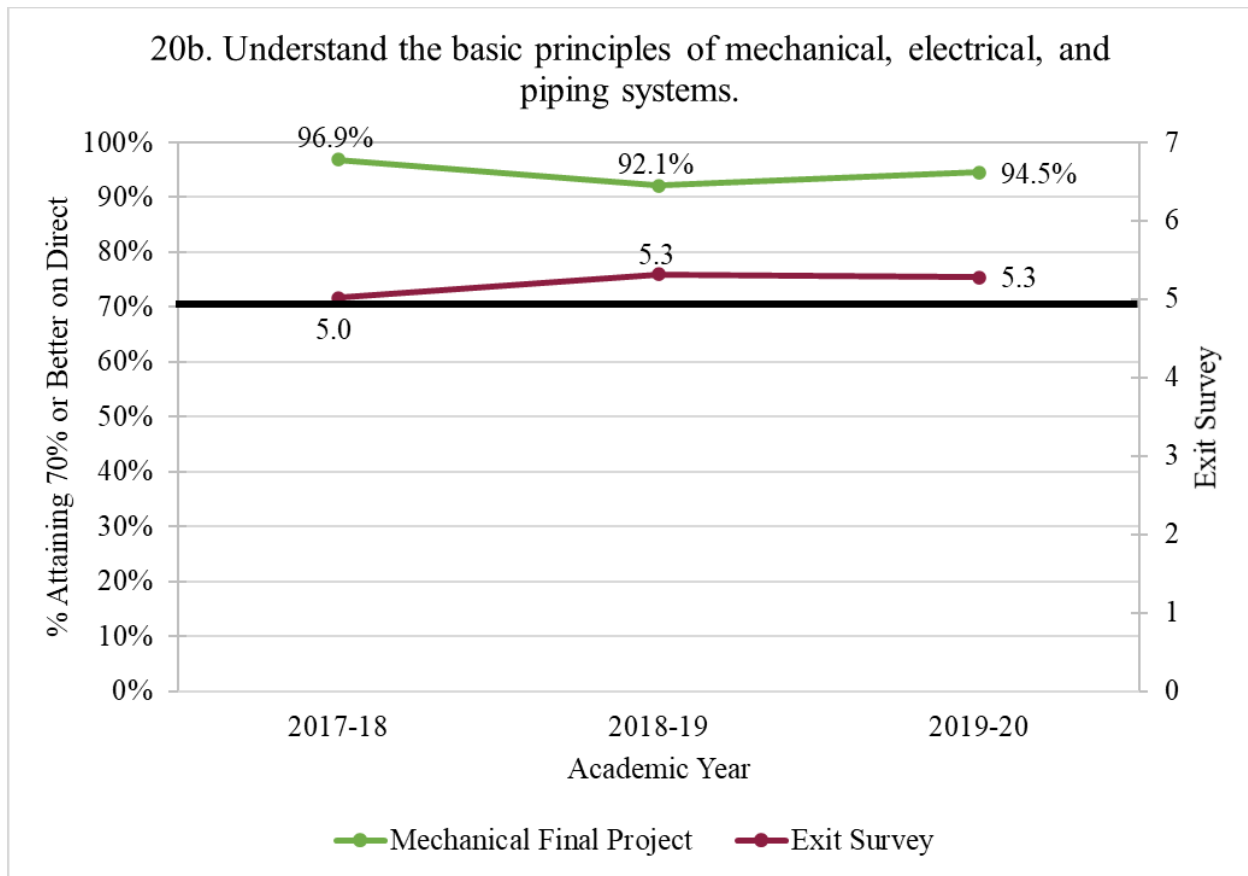
Action to improve or maintain (Aug 2020, for 2020-2021):

- Continue to emphasize the materials and methods of installation, and how the electrical systems integrate into the overall construction process.

Previous actions to improve or maintain:

Continue to give more detailed feedback. (2019-2020)

- Improve the feedback going to the students on the direct assessment tool. (2018-2019)



CON 345 Mechanical Systems

Action to improve or maintain (Aug 2020, for 2020-2021):

- “Formulate a procedure to meet desired needs.” Meets ABET (Part 1 of Final Project)
- Discuss with Kraig in CON 495 Construction Planning and Scheduling.
- Continue as-is.

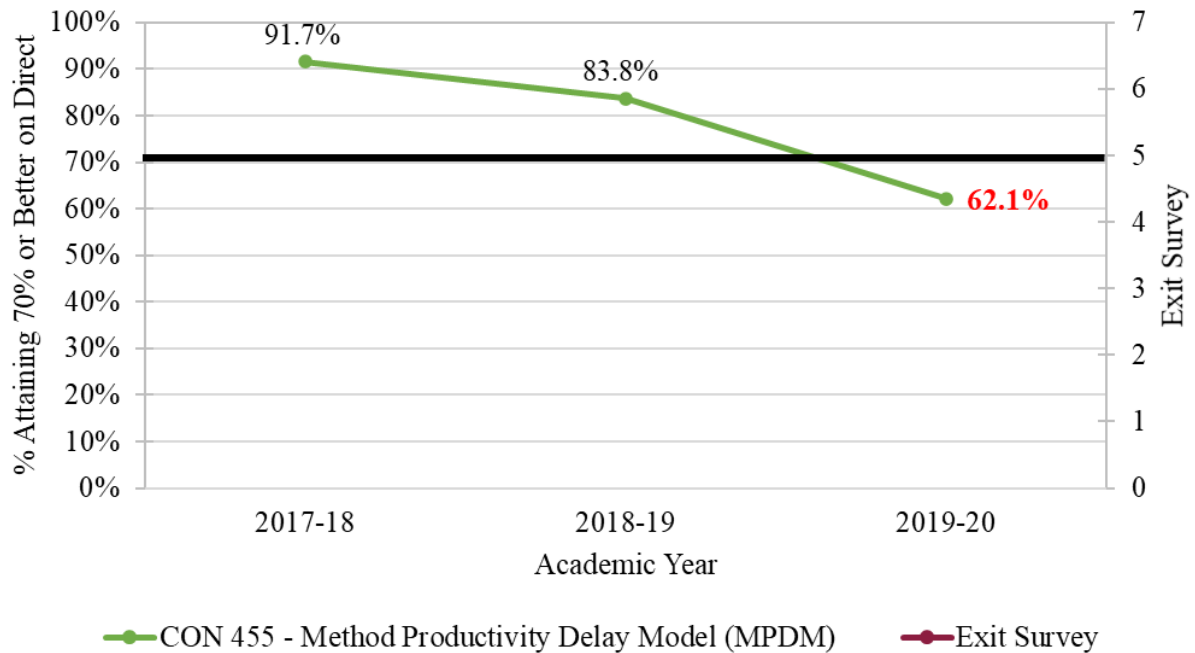
ALSO: ABET sole Performance Indicator for SO#2 An ability to formulate or design a system, process, procedure or program to meet desired needs. DOES IT (CAN IT) MEET ALL PARTS? Yes.

Previous actions to improve or maintain:

Continue to provide feedback. Continue to emphasize SLO is understand level. (2019-2020)

- Improve the feedback going to the students on the direct assessment tool. (2018-2019)

An ability to identify, formulate, and solve broadly-defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.



CON 455 Construction Project Management

Action to improve or maintain (Aug 2020, for 2020-2021):

- Technically based assignment; hurt by COVID shift. Keep watching.
- Need to add this SO to the senior exit interviews.

Previous actions to improve or maintain:

(Newly evaluated 2019-2020 AY)

April 27, 2018 – DEWSC Faculty Meeting Discussion; summary of changes to implement to begin assessing.

SLO #3 – Create a construction project safety plan

Changed from CON 271 to CON 491 Capstone, because the faculty voted to allow students to take CON 494 instead of CON 271, if they already possess a valid OSHA 30 card. This assessment change ensures we are assessing all students.

SLO #6 – Analyze professional decisions based on ethical principles

Changed from CON 455 to CON 271 AND CON 494, because the assignment in CON 455 is not adequate.

ABET b) an ability to design and conduct experiments, as well as to analyze and interpret data

Laboratory assignment created by the instructors of CON 310 Testing of Materials for Construction where the students will design experiments by selecting the appropriate soils tests necessary for ensuring compaction on a specific construction site. The students will conduct experiments to identify and categorize the soil type.

ABET f) changed to match SLO #6, above.

ABET h) CON 101 assignment removed from assessment, CON 455 assignment retained.