Annual Assessment and Public Information Dissemination Report for Construction Management

Academic Year (AY) 2023-2024

Missouri State™ UNIVERSITY

Missouri State University
Construction Management
Public Information Dissemination
As Required for ACCE Standard Section VIII

I. Program Goals and Objectives

The Department of Technology & Construction Management has developed a comprehensive plan to achieve the academic and non-academic goals as embodied in program outcomes, student learning outcomes, course learning objectives, and strategic plan goals and objectives. At a program level, a student, upon completion of this degree program, will be able to:

PLO #1. Demonstrate the application of oral, written, and graphic communication skills to present data/information and support decision-making. (*Technical Communication*)
PLO #2. Demonstrate the effective utilization of discipline-specific technical knowledge and skills. (*Technology*)
PLO #3. Utilize critical thinking, math, statistics, and science skills for problem-solving. (*Application of Math and Scientific Principles*)
PLO #4. Demonstrate leadership, participation, and problem-solving skills in a team environment. (*Teamwork*)
PLO #5. Utilize applied management topics to manage, control, and improve corporate environments. (*Applied Management*)
PLO #6. Demonstrate knowledge of safety, ethics, non-discrimination, and diversity in the workplace. (*Professional Responsibility*)

These program outcomes are embodied throughout the twenty student learning outcomes designated by ACCE and adopted by the program. These student learning outcomes are:

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

Lastly, the strategic plan for the Technology and Construction Management department operationalizes select strategies and action plans to assure the program learning outcomes and student learning outcomes are met. The goals that summarize this strategic plan are:

- TCM Goal 1: Strengthen academic programs through student recruitment, relevant and innovative curricula, and experiential learning opportunities that bridge the gap between the classroom and the workforce.
- TCM Goal 2: Prepare students for successful careers as technical managers within their communities and in a global context.
- TCM Goal 3: Recruit, retain, develop, and reward outstanding, diverse, and collegial faculty and staff who demonstrate high-impact academic and professional engagement.
- TCM Goal 4: Strengthen external relationships and grow our profile and reputation.

II. Program admission requirements

Students may declare the construction management major at any time prior to completing 75 credit hours. After declaring construction management as their major and upon obtaining a passing grade in either MTH 261 or MTH 287, students are admitted into the degree program upon completion of the application to a degree program form.

III. Program Assessment Measures

The construction management program collects and analyzes data from ten assessment measures as outlined below. These measures, their frequency, and their relationship to the department goals and program outcomes are also indicated below.

Instrument Number	Instrument	Direct Indirect	Program Level Course Level SLO Level	Where\when Implemented	Frequency	Feedback	Implementation of Changes	Goals (Strategic Plan) and Program Outcomes
1	Senior Exit Examination	D	C, S	Completed in capstone course by all students	Fall and Spring	Summary and objective-specific feedback supplied to all faculty	Faculty adjust courses and evaluate questions under the direction of the assessment committee	Goal 1 Program Outcomes 2,3,6
2	Capstone Course	D	P	Presentation and paper completed by all students in the senior capstone course	Fall and Spring	Results are summarized by course faculty and discussed at end of semester meeting	Weaknesses are identified by grading matrix and a strategy is discussed at the fall faculty retreat to correct deficiencies	Goal 1 Program Outcomes 1-6
3	Course Folders	D	C, S	All course folders are to be current at the end of the academic year, placed in the departmental	Spring	Folders are reviewed by the department head and department	The department head and curriculum committee formally request course changes	Goal 1

				office, with Instructor Course Evaluations completed		assessment committee with feedback provided to the faculty	and monitor for corrections	
4	Advisory Board Course Review	D	C, S	All courses folders are evaluated by advisory board curriculum subcommittee.	5-Year Rotation, 4 SLOs per year	Advisory council provides feedback using feedback form	Department head reviews suggestions individually with impacted faculty and corrective strategy is formulated	Goal 1
5	Strategic Plan Progress Review	D	P	Week before Fall classes at departmental planning meeting	Fall Faculty Planning Session	Department as a whole reviews progress toward goals	Department head monitors and adjusts plan as needed in consultation with faculty	Goals 1-4
6	Course Evaluations	I	C	Completed by all students in every course	Fall and Spring	Compiled by university. Feedback provided to individual faculty and department head	Faculty discuss changes to address concerns with department head and monitor for improvements	Goal 1
7	Senior Exit Surveys	I	P, S	Completed prior to exit interview by all graduating seniors	Fall and Spring	Department Head compiles results which are discussed with faculty	Department Head discusses feedback with faculty to determine if a problem exists and corrective strategy is formulated	Goal 1
8	Senior Exit Interview	I	P, C	Completed by all graduating seniors, conducted by department head	Fall and Spring	Department Head summarized feedback which is discussed in general with all faculty and when needed with specific faculty	Department Head discusses feedback with faculty to determine if a problem exists and a corrective strategy is formulated and monitored.	Goal 1
9	Alumni Surveys	I	P, S	Completed by all alumni from prior five years	Every five Years	Department Head compiles results which are discussed at fall planning session	Department Head discusses feedback with faculty to determine if a problem exists and corrective strategy is formulated and monitored.	Goal 1

10	Employer Survey	I	P, S	Completed by employers hiring graduates from prior five years	Every five years	Department Head compiles results which are discussed at fall planning session	Department Head discusses feedback with faculty to determine if a problem exists and corrective strategy is formulated /monitored.	Goal 1

IV. Information Obtained from Assessment Measures

A. Senior Exit Exams

The senior exit exam is administered as the final exam in the required capstone course – TCM 499, Senior Project. The instrument provides a measure of student learning outcomes at the analyze, apply, and understand level. It is a compilation of all the standardized examination questions administered at the course level and provides feedback to the faculty on student performance. While these measures do not form the basis of whether corrective action is required at the course level, they do provide an invaluable longitudinal look at student progress and knowledge retention. For fall 2023, the mean score on the senior exit exam was 55.34% and for spring 2024, the mean score was 58.48%.

B. Capstone Course

Fall 2023

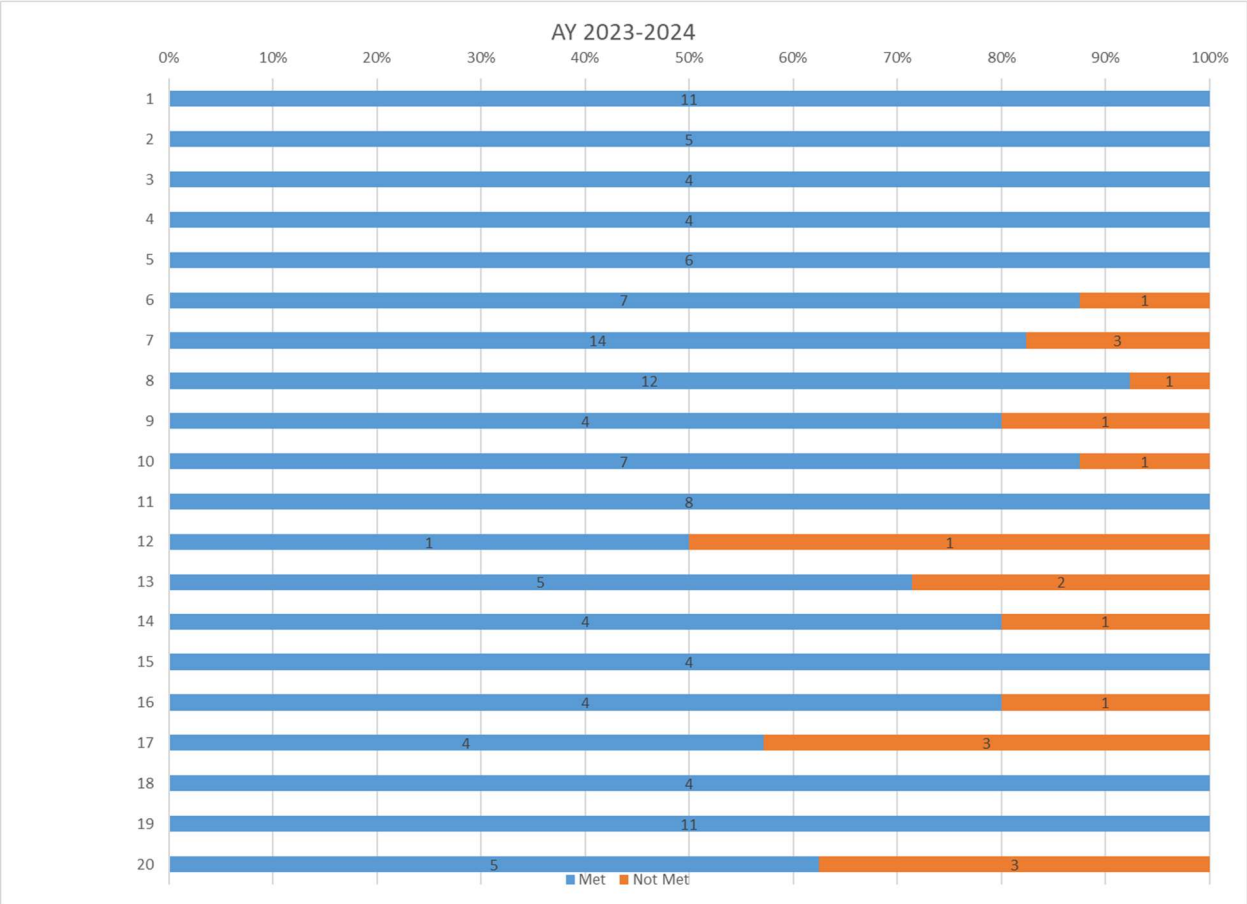
This semester, the course project was the Kemper Hall Expansion. Being an expansion specifically for the CM program, the students fully engaged in the project. The 10,000 square foot expansion seemed to be a manageable size with respect to estimating. Additionally, the project bid, award and initiation occurred during the semester. Intermediate presentations were returned to the traditional five during the semester and final presentations were given in front of industry professionals. Noted weaknesses were in construction sequencing and scheduling, especially on the demolition of the existing building and how the structure of the expansion needed to be approached. Understanding the pay process was also noted but was poorly defined in the construction documents. Major improvements were noted by faculty and industry in the professionalism of the presentations, BIM modeling and site logistic plans.

Spring 2024

This semester, the course project was a 9,000 square foot new Autism Center for Missouri State University, West Plains Campus. Though the construction was relatively straight forward, the availability of craft workers, equipment and materials was a challenge. Additionally, the building was placed in the middle of an existing road which required coordination with the city and the campus. This semester continued five intermediate presentations and a final presentation in front of industry professionals. Understanding the Disadvantaged Business Enterprise process and communication for the road closure was a weakness. The MSU pay process and impacts to contractor cashflow was also noted as a weakness, again poorly defined by the construction documents. Industry and faculty noted improvements in presentation professionalism, modeling, site logistics and project schedules.

C. *Course Folders*

Course folders were collected and updated with syllabi, instructor course evaluation forms, and representative work samples for all major assignments/exams. As most student learning outcomes have multiple direct measures, the chart below shows the number of direct measures that were above and below the target level of 70% as detailed in the Assessment Implementation Plan. For all of the SLO's, at least 50% of the direct assessment measures met the desired 70% pass rate. No corrective action plan is required at this time for program-wide SLO's. However, corrective action plans have been prepared at the course level for SLO's not meeting the 70% threshold.



D. *Advisory Board Course Review*

AY 2023-2024 The content slated for review in Fall 2023 was TCM 221 and TCM 320. In Spring 2024, TCM 226 and TCM 321 were reviewed. A summary of the feedback is presented below. The CMAB overall program review was last completed in Fall 2022. The next overall program review will be in Fall 2027 or 2028 (5-6 year cycle).

- **Fall 2023 – In the fall of 2023, the CM transition data collection platforms for the CMAB course reviews. For this reason, the data in Fall 2023 was collected as hard copy responses to 6 questions. A full summary of the responses follows.**
- TCM 320 – Construction Contracts (n=29)
    - SLO Coverage Appropriateness and Adequacy not collected.

- Course Overview
  - Very Appropriate
  - Yes, appropriate for this level
  - Yes – subject matter is appropriate and learning outcomes are appropriate for discipline and level
  - Lots of content covered – potentially too much
  - Good contract review and project delivery methods
  - Not very useful for new hires. Focus on reviewing plans/spec, sub bids, and then writing scopes.
  - Yes – covers a wide variety of areas that are important in industry
  - Yes – types of contracts are vital
  - Yes, seem to be in line with level of knowledge that these students have
  - Well prepared and hits most, if not all, of the major areas of real subject matter
  - A lot of information – adjust to make sense in a one semester time frame
- Course Content:
  - No topics should be removed
  - This course has a ton of information – maybe too much
  - Areas of knowledge in subject are addressed in course content
  - Too much covered in one course
  - Nothing to be removed or added – although, overwhelming
  - Content is relevant and appropriate for course
  - Very thorough
- Strengths:
  - Different kinds of contracts
  - Delegated design
  - Understanding the "why" – Understanding what could go wrong
  - Class discussions
  - Wide Variety of exposure to contracts
  - Healthy dose of industry needs
  - Great approach to facilitating open discussions with students
  - Relevant to construction industry and future career preparation
  - Wide range of contract types
  - Real life legal contexts
  - Good job at starting from the basics
  - Requiring active participation
  - Well versed instructor
  - Negotiation principles
  - Formal presentations
  - Exposes younger students to drawings and teaches them the basics of reading these documents
  - Real life role playing
  - Engaging the room
- Weaknesses:
  - Lots of technical information – unsure how to divide time
  - More importance on attendance, less importance on 3 exams
  - Exam heavy
  - Too much information – suggest splitting into 2 part course
  - Consider making class a 2 part class – too much information
  - Information overload for one semester
  - Lots of information to retain

        - Limit higher level contract language review
        - Does not cover much on insurance
        - Mostly graded on tests/quizzes
        - Information overload
    - Suggestions for Improvement:
        - Try to get more professionals to give real world examples
        - Seek industry professionals who can provide in person workshops and real life experiences to share with students
        - More quizzes or projects – less exam heavy and dependent
        - With the amount of information being taught – challenge students to generate ways to help retain information
        - Make sure students have solid understanding of the importance of the general requirements
        - Would like to see an exercise where you have to find notification requirements, mark-ups, etc.
        - Try to keep more lower level and simple
        - Would have liked to see more on contract review
        - Expose to solicitations/RFP's
        - Spending time on importance of strong scopes of work within subcontracts would be worthwhile
        - Guest speaker
    - Other Comments:
        - Exams heavy on grading scale
        - Enjoyed the memes – comic relief
        - A lot is managing risk. Course seems to provide a good foundation
        - Teach them how to create tools in Bluebeam and other tips/tricks
        - Thank you for being a teacher – I can hear your passion for your craft
        - Consider mentioning how PO's can pose a problem
- TCM 221 – Construction Documents & Quantity Takeoff (n=28)
    - SLO Coverage Appropriateness and Adequacy not collected.
    - Course Overview:
        - It is appropriate
        - - is more important and – more –
        - Students need more time with plan reading – understanding
        - Yes, this is very entry level course – fitting for the age of student & upcoming courses
        - Yes, the subject matter is appropriate
        - Yes, understanding, reading, interpreting CD's is vital to success in the construction industry. Every design/construction professional has to know these skills
        - Learning objectives are all appropriate
        - Competence of how to navigate and understand drawings is CRITICAL
        - QTO is utilized throughout life cycle of project
        - Learning outcomes are very good. Good approach how the course is taught. Doing quantity takeoffs to learn blueprint reading is a good way for students to look at drawings of spec requirements
        - Yes, appropriate
        - Yes, Seems to be a good starting point for students who have never been exposed to plans & specs
        - General light touch of many aspects of plans/specs. Not too heavy for 2nd/3rd semester class. Quantity take-offs, volumes, areas, etc
        - Yes, this is a foundation course students will need to know - - the industry

        - Yes- a good foundation for upcoming advanced classes
        - Yes - reading drawing + take-offs are extremely important. I think its important to stand out reading drawings, because its something you use in everyday life.
        - Yes, course seems to be on par with program
        - Yes. Its surprising the amount of intern we bring in that cannot read a set of drawings. You spend most your time training them on this rather than more crucial aspects of the project.
        - Yes
        - Yes, this course is a great building block. It would be beneficial to include a project within it where a budget is presented to an owner and then VE options reviewed to get within budget.
        - Appears to be a great introduction/entry level course to plans/specifications
        - Yes good content + course converge
        - Plan reading + documents are very vital to the CM program
        - Yes
        - The subject matter appears to be very basic + a good start to understanding + trading construction documents
        - Yes Yes
        - I tend to believe level of material is appropriate.
    - Course Content:
        - Use a major software to do takeoff's
        - Major blue beam training!
        - Content is appropriate
        - The course content covers the noted SLO 7+17 requirements. Possible inclusion (High level) Construction documents
        - Yes, content of course addresses needed areas of knowledge
        - Reduced amount of - - in this course
        - Consider using On Screen takeoff for QTO
        - Don't allow Adobe… industry does not use it. Make them learn Bluebeam
        - Look at more electronic means for students to learn
        - Don't agree with 5% for attending career fair
        - Yes, No, No
        - Yes
        - I believe it meets the needs
        - The 'less complex' overview of trades seems like a good way to go introducing to specs are also a good move
        - Yes, I believe the content does address the areas
        - Yes see below for comments
        - It gives a broad sense of each area/phase of construction. Hard to get in the - , but would be nice to focus on more of the architectural.
        - Yes. Stick to QTY take off and avoid estimates at beginning level.
        - Does the amount of time spent on mech/elec drawings allow for material retention? Better in mech/elec course?
        - Yes, would like to see more interaction between plans and specs. Teaching about how to read plans efficiently and how drawings are normally organized (when to look at wall selections/roof details/Elevations/etc. I.E. what type of drawing would you look at to find the exterior finish? (ext. Elevation). Do you have a section covering general notes? Do you focus on schedules interior finish/wall types?

        - Yes, similar to above, taking te kids through a VE exercise
        - Yes course is thorough. Would not recommend adding more as there is already a lot of information covered
        - Yes does good job of teaching students how to begin to read plans
        - Yes, Go more In-depth on the use of Bluebeam to mark up drawings + scale
        - As beginning level course, this provides a basic knowledge for students who haven't seen plans before. It does address slot
        - As an introduction course, I believe the course hits the area of knowledge
        - Yes No No
        - Seems like basic information for most scope items as covered
    - Strengths:
        - Good variety of plan exposure, introducing Bluebeam
        - Grading scale seems balanced
        - Introduction to construction documents mu--- for successive courses
        - Provides “building blocks” for plan reading and understanding/applying documents to quantities
        - Using takeoff as a means to learn drawings is awesome
        - Attendance required to succeed
        - Subject matter is instrumental to success in the industry
        - Understanding of Bluebeam
        - Student involvement and class attendance
        - Good overview on basic plan reading on different disciplines
        - Utilize Bluebeam or hand take-off
        - Introducing students to drawings
        - Plan Review
        - Bluebeam
        - Great for takeoff
        - Taking Early in major
        - Using a project om campus/Springfield
        - Bluebeam
        - Bluebeam is an important tool for everday use. Great that it’s introduced early
        - Overall covered of industry to get a broad idea of all phases.
        - This is a great beginner level class. Basic knowledge used in everyday construction
        - Drawings from various A/E’s
        - Does a great job of starting with the basics, and then building from there.
        - Use in Bluebeam is very important. Using Hard copies is good but continually move to Bluebeam.
        - Teaches Bluebeam to students
        - Teaches basics of estimating/take-off
        - Giving students tasks w/in drawings for – use
        - Providing a base knowledge of plans. Teaching of Bluebeam
        - Overall the qty take-off aspect makes sense + helps -

        - I like that you start with the basics + lead into on screen. I would consider not going back after you get to the on screen.
        - The use of real world plans
    - Weaknesses:
        - What tools do you use for takeoff's software
        - Intro course/Gateway course. Its difficult to approach a technical subject as a node that supports so many successive course
        - Civil drawing/takeoff
        - Reading of Schematic, DD, or other levels of incomplete documents
        - Pursue large project examples. Large Gcs will have more complex projects
        - Mechanical? Electrical plan reading could be reduced from an entire month, instead more time could be spent on structural systems. Complete understanding /introduction of mechanical/electrical systems is less important unless students plan to work @ Mech contractor or spend time introducing civil work/drawings.
        - Need more examples of type construction types
        - Outdates techniques (Scales)
        - Lack of variety in plans (- - -)
        - Maybe too much
        - Make sure they are able to find details that are in the drawings. Maybe – RFI's from trades that can be – and be found in the drawings & Specs.
        - Mention of a video – Should the goal be to make an MSU-made video for this instead?
        - Different projects to look at. I think that would be helpful. Every Architectural firm (+engineers) design differently, and its important to pay attention to the differences to figure out. Spaces--> front and review would be beneficial
        - Not sure
        - None
        - I dont see any really. Maybe take Bluebeam usage a little further. Bluebeam has a short-cut pdf with various ways to speed up mark-ups.
        - A lot of content to cover our course of semester?
        - Doesn't address residential construction plan
        - I think it would be good to see assignments including MEP sheets
        - Maybe don't - to the students weakness. Not that you don't hold them accountable. I don't know I am not there. I just heard you say a couple of times that they cant handle this or that.
        - None
        - Contractor feels to much spec information students are not ready. Considering level of students at this point I had to agree – maybe a – more would be benefit
    - Suggestions for Improvement:
        - Ask local companies to come in and help more often! Teach the importance of good note taking
        - I would say teaching the use of scales briefly is fine, but really focusing on using digital/Bluebeam, industry is so tech/digitally focused
        - RFI Basic exercise. Identifying conflicts in specs vs. Drawings. Which supersede?

        - Career fair attendance = 5% of total grade; seems excessive. Recommend waking this part of homework score; reallocate this 5% to Lab
        - Suggest making all students use Bluebeam. Its pretty industry standard. We use on-screen takeoff to do our Qty takeoff, but you have to have license
        - Use more technology as that is the – from hard copy to electronic software programs
        - Bigger emphasis on Bluebeam
        - Force kids to use Bluebeam. Everyone is using - - takeoffs
        - Use of digital media exclusively
        - Do you cover how to slip sheet updated drawings & post RFI's?
        - Would suggest to early hand take-off & then move to Bluebeam all
        - For Architectural drawings --> I would include reviewing door schedules + specs. They are very tedious
        - Helpful to look @ different types of projects with different design teams.
        - Bluebeam work needs to be a focus
        - Submittals would be a good area to add more focus on.
        - Keep course intriguing. Maybe a little more Bluebeam
        - Highlight elements in the drawings and make them tell you what products are approved in the specifications
        - In addition to the VE exercise, maybe having them check the takeoff on a concreate or steel change order from a sub
        - Ask industry advisory board for recourses i.e. building plans for different types of construction
        - Focus completely digital, no paper plans
        - Getting involved in creating plans on revit or other software
        - Teach another bolt placement on steels
        - I think the course sounds great
        - Maybe on site field trip with card copy plans
        - Understanding how arch + students are related. Cannot stress enough how important basic drawing navigation is
    - Other Comments:
        - Wish this class was available when I attended this program
        - While suggestion was made to strictly use Bluebeam for take-off. I would teach them to use manual scale just so they know how to use.
        - Reach out to local constructions for local recourses to use in class
        - Thank you for being a teacher + caring about your students. My wife is a teacher and I understand there are trails that come with the successes.
        - Schedule of semester is reasonable + makes sense. Starting from a baseline in understanding how to read drawings, knowing students don't have experience. Bluebeam construction. Like digital focus

- **<u>Spring 2024</u>**
- TCM 226 – Construction Project Administration (n=13)
    - SLO Coverage Appropriateness (4.62/5.00) and Adequacy (4.46/5.00). Mean for all SLO's addressed in the course.
    - Noteworthy comments:
        - SLO 17 for TCM 226 - I wouldn't spend too much time on this. This is more of a human resources or administrative item. In my opinion this shouldn't be something to expect them to learn/know.

- Overall, the course objectives look very appropriate for students at this level. The importance of building and updating project schedules is something that can never get enough focus in the industry. Anything we can do to teach the importance of scheduling at the college level will pay dividends later in their careers.
- Great coverage of front end docs, could benefit from more direct correlation between drawings, specs, submittals, RFI's and a how to use them in conjunction to gather the information needed.
- Dive into estimating and quantity take off from the DRAWINGS. Being able to read drawings is everything in construction. Its step 1
- This class provides a very well-rounded foundation for learning & applying construction procedures in the construction industry, as well as prepares students for later courses. The objectives of this course are quite on point in my opinion.
- TCM 226 is a course that could help students out before going into their first internship. More of the document side of things could go more into depth along with the construction software.
- Understand the basics of sustainable construction including the LEED rating system (ACCE SLO 18) - didn't see this one represented in the course lecture materials.
- Since this is my first time giving my feedback for this course TCM 226, I thought overall you have covered the basics of project administration for all of the objectives, especially the second year of college. I do like the Procore certification requirement for all students since Procore is used by the majority of construction companies.
  My only suggestion is, since they are using Procore for their certification, have you thought of using Procore for some of the objectives? For example, how to upload an RFI, create a workflow and review a submittal, create a change event, etc. Just something to think about if the cost of the program is not expensive.

· TCM 321 – Mechanical Systems for Buildings (n=14)
  - SLO Coverage Appropriateness (4.44/5.00) and Adequacy (4.46/5.00). Mean for all SLO's addressed in the course.
  - Noteworthy comments:
    - This course is very detailed and is very helpful. I could see this being a beneficial resource to reference during mechanical scope review during current projects.
    - To be completely honest, by the time I started working full time I remembered almost nothing from this class. I took it my second semester Freshman year. After looking through everything I think only about half of it or maybe less is actually beneficial to what I do or see day to day. Understanding the different HVAC and plumbing systems is very important, so you understand how they work and what challenges they bring. However, when it comes to calculating heat loss/gains, energy conserving and designing HVAC systems, I don't think that is relevant at all unless a student is wanting to go into a Mechanical specific field. Maybe there is a junior or senior level class that can include those items if they are interested.
    - Most information is appropriate and adequate. A big item I don't think is covered adequately is interlocking of equipment. This may be more of an electrical topic, however every project i have with a kitchen seems to struggle with interlocking HVAC equipment to kitchen

hoods/ FA/ etc. I think part of the problem was myself not knowing how these things work.

- Looking at this through the lens of a construction manager, and what you want a new project engineer to know coming to a jobsite, this course could focus less on psychrometrics and load calculations. Spending more time on things like what the use cases are for different mechanical systems and the why behind a certain system being selected for a particular project is more beneficial than knowing how to do load calculations. More emphasis on the cost and schedule impacts would also be helpful. Lastly, understanding how to read mechanical drawings is critical and in the outline it does refer to that being a part of the course but it's hard to get that from the lecture content.
- Only (6) Course Objectives for this TCM course are on the syllabus.
- This course is for Construction Management, I believe they should adopt a dual approach. Firstly, providing a comprehensive understanding of the mechanical field, its components, and operations is crucial. This foundational knowledge equips project managers and superintendents with a broad understanding of the domain, enabling them to navigate various scenarios effectively. However, it's equally important to zoom in on specific aspects pertinent to the roles of Project Managers (PMs) and Superintendents assisting with client translation and assisting with the overall sale of the project. These include Quality Assurance/Quality Control (QA/QC) procedures, Project Close-out protocols, and client interactions specific to the mechanical trade. By focusing on these areas, we empower PMs and Superintendents to tackle real-world challenges efficiently, enhancing project outcomes and client satisfaction. Moreover, in today's rapidly evolving landscape, automation is increasingly shaping the mechanical field. Therefore, dedicating segments of the course to Building Automation Systems (BAS) and Testing, Adjusting, and Balancing (TAB) is imperative. BAS plays a pivotal role in optimizing building operations, energy efficiency, and occupant comfort which ultimately leads to cost savings. Similarly, understanding TAB procedures is essential for ensuring system performance, compliance with regulations, and cost savings. No need to be an expert but being able to understand fundamentals allows you to call out the BS. To maximize the impact of this course, I propose dedicating specific slideshows to BAS and TAB. This focused approach will provide participants with in-depth insights into these critical aspects of modern mechanical systems, equipping them to harness the full potential of automation and optimize project outcomes.
- Since this is my first time giving my feedback for this course TCM 321 and overall, this course is excellent of covering the materials. What I like about this course is the material is heavy for some students but reviewing examples of contract documents (drawings and specifications) is a great way for students to familiar with the equipment.
- Excellent coverage of calculations/sizing. Good to see some focus on how plumbing and HVAC systems can interact with other aspects of a building/other trades work. Could benefit from more focus on that aspect of things as well as sequencing work. Exams could use some polishing (missing units, somewhat vague questions, etc.).

        - The first three course objectives are taught well throughout the semester. Design of plumbing and HVAC is more hit on the load design rather than layout design, which could be something to clear up.

E. Strategic Plan Progress Reviews

This summary was prepared at the beginning of a new strategic plan cycle (2023-2028). The below framework includes both the academic unit and program goals/objectives for the upcoming period. No all goals/objectives will be addressed by the CM program. Specific initiatives and/or strategies are noted, along with the implementation date.

- **Goal 1: Strengthen academic programs through student recruitment, relevant and innovative curricula, and experiential learning opportunities that bridge the gap between the classroom and the workforce.**
    - Objective 1.1 – Attract and retain high-potential students.
    - **CM Departmental Target:** Attend 3 events per academic year.
        - 2023-2024 – Build my Future, ACE mentor program, Home school presentations by students in TCM 401, Construction Leadership. Active Sigma Lambda Chi chapter, 16 initiates.
    - Objective 1.2 – Attain/maintain accreditations for all programs.
    - **CM Departmental Target:** Perform annual course and program reviews.
        - 2023-2024 – Preparing to update ACCE SLO's in all courses and update data collection reporting. Prepared the ACCE annual disclosure.
    - Objective 1.3 - Review and revise both undergraduate and graduate program curricula/content to ensure they are current, innovative, forward-looking, and competency-based.
    - **CM Departmental Target:** Maintain the CMAB course review cycle, 4 reviews annually.
        - 2023-2024 – CMAB course reviews completed. Performed a faculty review of all TCM Courses.
    - Objective 1.4 - Encourage and promote interactions between students, faculty, and professionals in both academic and professional settings to actively engage students in the learning process.
    - **CM Departmental Target:** Conduct two lunch and learn sessions with industry professionals per semester.
        - 2023-2024 – Two sessions completed (McCown Gordon – evaluating offers, and McCarthy - Revisto).
    - Objective 1.5 – Strategically manage/grow enrollment.
    - Objective 1.6 – Maintain and modernize classroom and lab facilities/equipment.
    - Objective 1.7 – Enhance outreach efforts for underrepresented populations in each program and make available adequate resources for those students.
- **Goal 2: Prepare students for successful careers as technical managers within their communities and in a global context.**
    - Objective 2.1 – Achieve 100% placement for graduates of our programs.
        - 2023-2024 – In support of this goal, approximately 70 employers were represented at the fall 2023 career fair and approximately 45 employers were represented at the spring 2024 career fair.
    - Objective 2.2 - Provide high-impact student engagement opportunities for all programs including options for internships, job shadowing, or mentoring programs.
        - 2023-2024 – 4 teams participated in the ASC R4 Competition. One team representing MSU participated in the MCAA National competition.

    - Objective 2.3 - Develop resources and communities for international students.
    - Objective 2.4 - Promote and actively support involvement in department student organizations that focus on professional development and public affairs.
        - 2023-2024 – The program currently has 6 recognized student organizations. Construction Club (AGC), MSWIC, MCAA, Concrete Consortium, HBA, Sigma Lambda Chi, ABC. These clubs receive funding from the MSU and the College of Business. Notable service included ongoing street cleaning and a portable homeless shelter constructed and delivered.
- **Goal 3: Recruit, retain, develop, and reward outstanding, diverse, and collegial faculty and staff who demonstrate high-impact academic and professional engagement.**
    - Objective 3.1 - Actively recruit diverse and collegial faculty who are highly effective in teaching, research, and service and committed to diversity, equity, and inclusion.
    - Objective 3.2 - Promote a culture of importance around scholarship and high-impact intellectual contributions with an emphasis on societal impact and public affairs.
    - Objective 3.3 – Increase the profile of professional organization involvement for faculty.
        - 2023-2024 – Dr. Gebken, ASC National Treasurer, Dr. Sauer, ASC R4 Assistant Director, JaLynn Hill ASHRE of Springfield.
    - Objective 3.4 - Provide resources and support for the development and implementation of experiential learning opportunities.
    - Objective 3.5 – Recognize and reward outstanding contributions to teaching, research, and service.
- **Goal 4: Strengthen external relationships and grow our profile and reputation.**
    - Objective 4.1 - Promote meaningful engagement with the Industry Advisory Boards for each academic program.
        - 2023-2024 – Fall and spring CMAB meetings.
    - Objective 4.2 - Engage in activities that build affinity among all department constituents to encourage and promote support of the department both now and in the future.
        - 2023-2024 - Fall career fair mixer/corn hole tournament, spring alumni golf tournament, alumni mixers in Springfield, St. Louis, and Kansas City.
    - Objective 4.3 - Create opportunities to inspire alumni to inform, engage, and support the department and its students.
    - Objective 4.4 – Create marketing material and social media content that increases engagement with all department constituents.

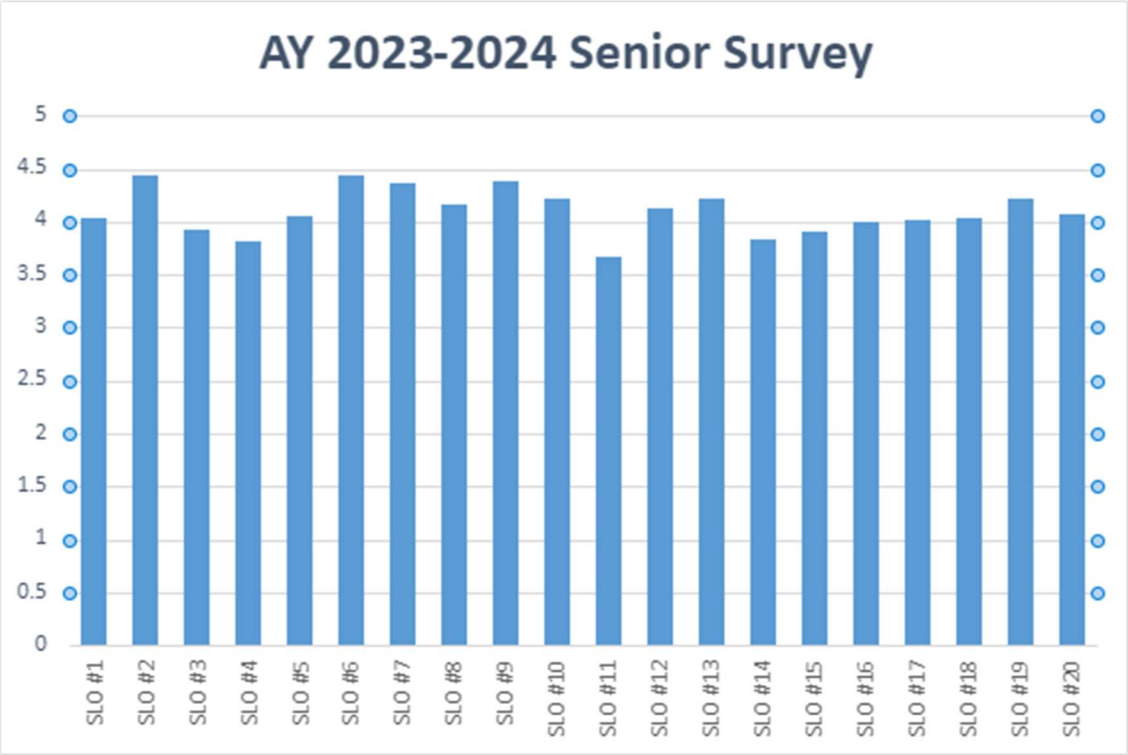
F. Course Evaluations

For AY 2023-2024, student evaluations of teaching were collected in both fall and spring semesters. The mean student evaluation of teaching scores for CM courses was 4.33/5.00. The standard deviation for the same time was 0.39 points. The mean student evaluation of teaching score for the Technology and Construction Management department was 4.39/5.00 with a standard deviation of 0.39.

G. Senior Exit Surveys

Each semester, graduating seniors are asked to complete a survey that assesses their perceived level of preparedness across each of the 20 student learning outcomes. In addition, this

instrument also collects information about the courses and/or individuals who most contributed to these outcomes and job placement information. For AY 2023-2024, the mean perceived level of preparedness for all SLOs was 4.10/5.00 with a standard deviation of 0.22 points. The figure below shows the distribution of scores for the senior exit surveys. The three lowest rated SLO's are SLO #11 (3.66), #4 (3.81, and #14 (3.83). The three highest rated SLO's are #2 (4.44), #6 (4.44), and #9 (4.39).

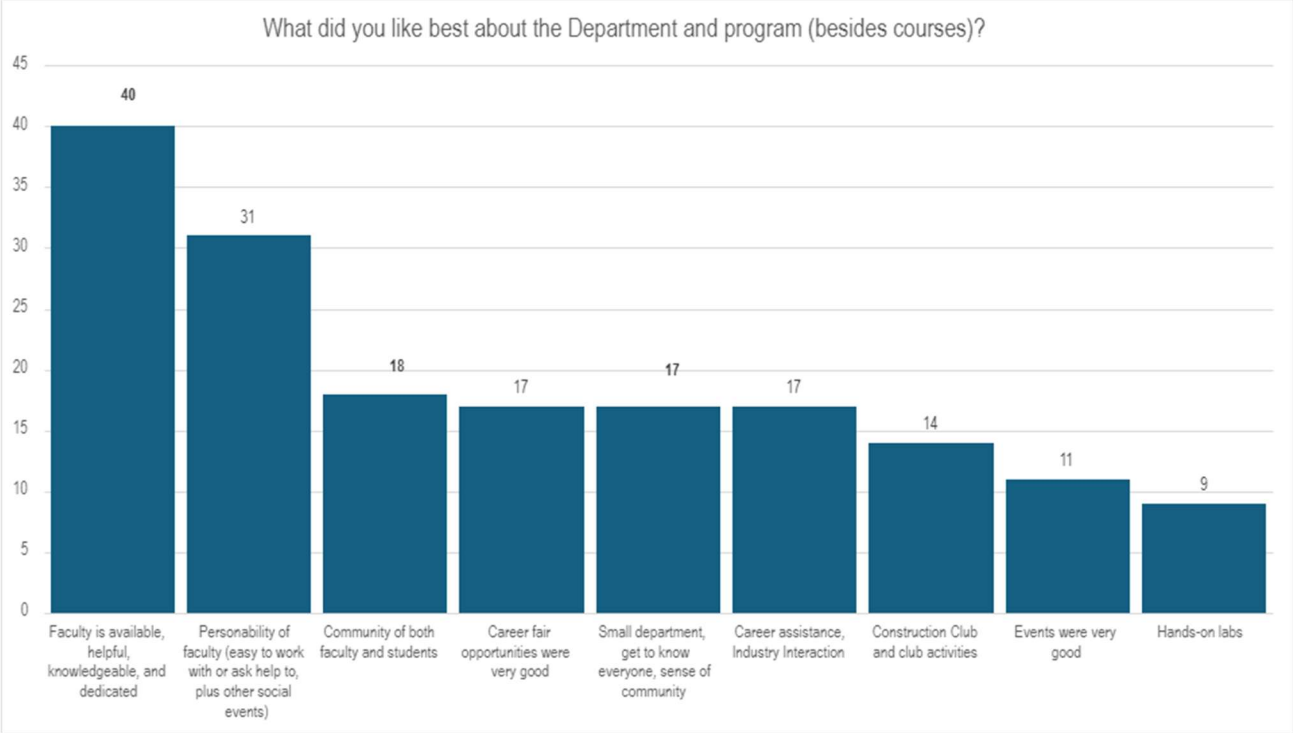


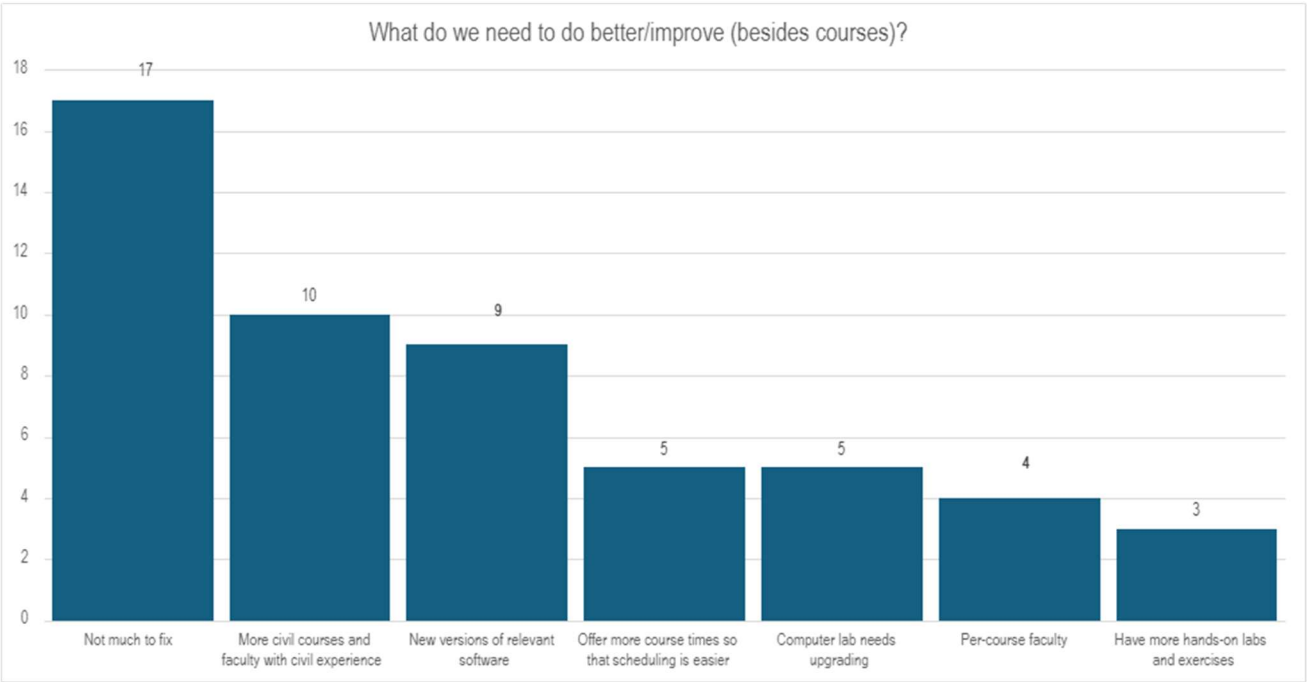
H. Senior Exit Interview

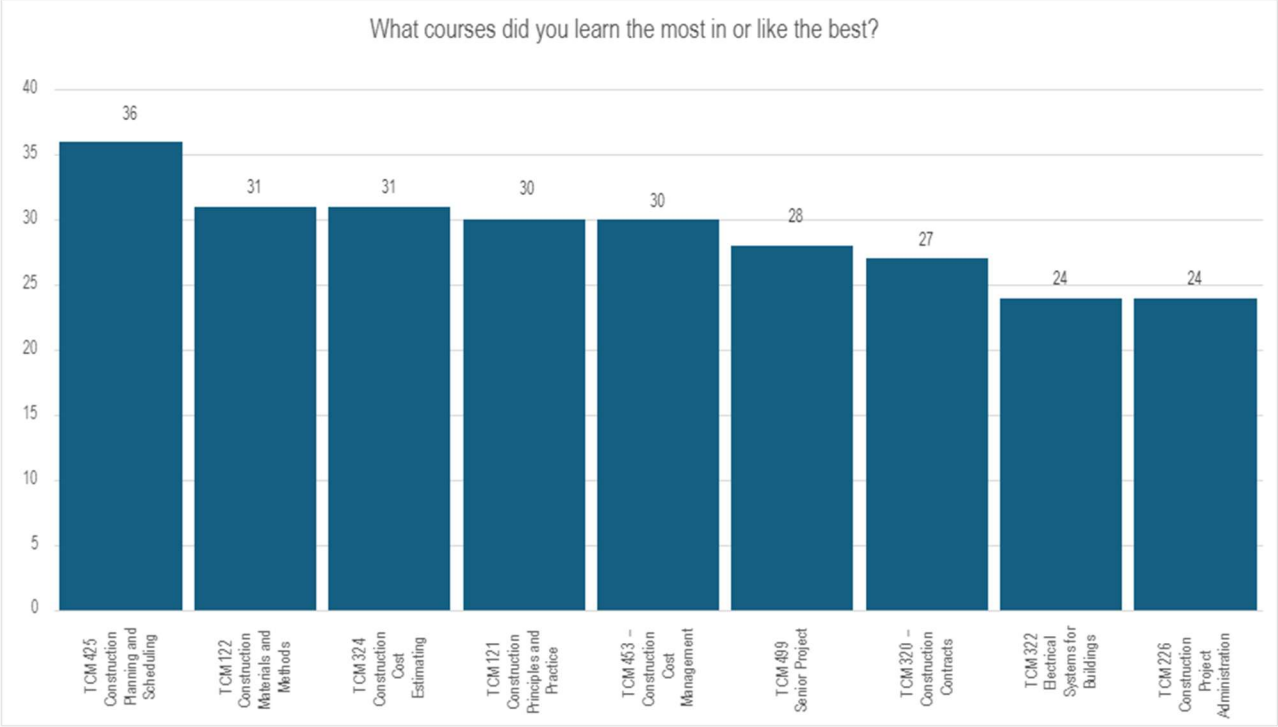
In addition to the senior exit survey, graduating seniors also individually sit down for exit interviews with the department head each semester. The questions asked during the exit included the following:

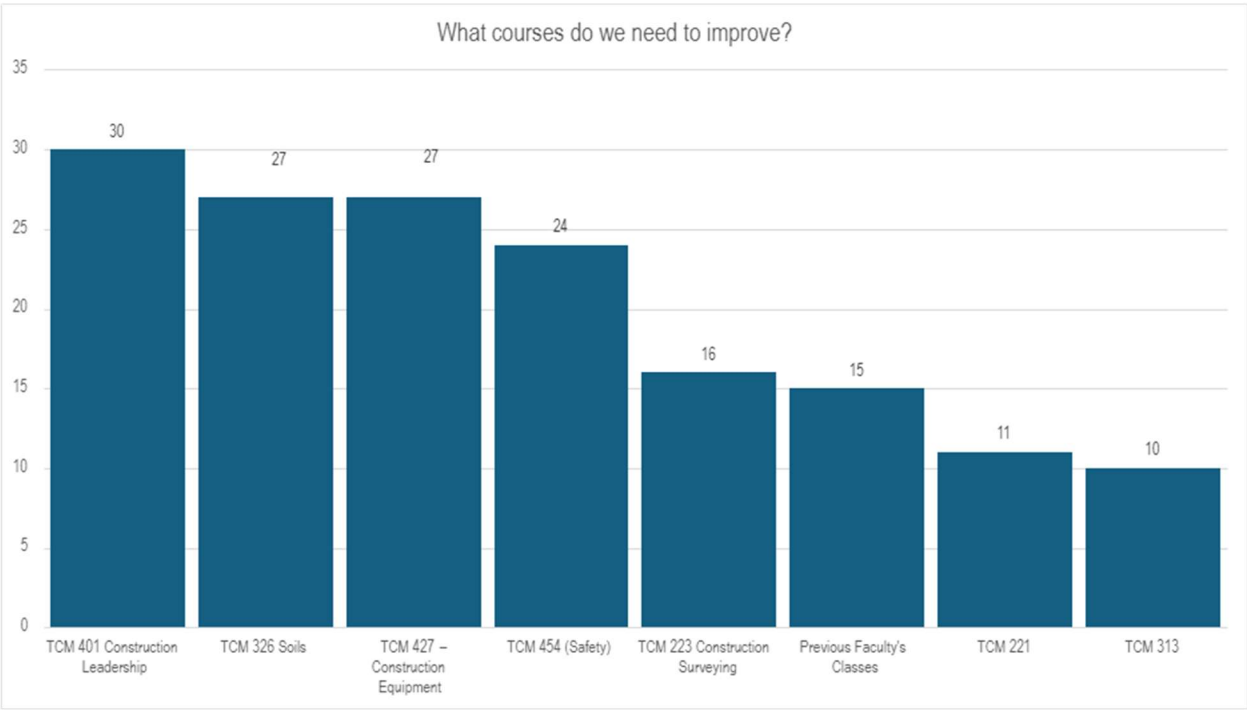
1. What did you like best about the Department and program (besides courses)?
2. What do we need to do better/improve (besides courses)?
3. What courses did you learn the most in or like the best?
4. What courses do we need to improve?

Pareto charts for the top responses from these interviews are presented below for the entire 2023-2024 academic year.


What did you like best about the Department and program (besides courses)?
45
40
35
30
25
20
15
10
5
0
40
31
18
17
17
17
14
11
9
Faculty is available, helpful, knowledgeable, and dedicated
Personability of faculty (easy to work with or ask help to, plus other social events)
Community of both faculty and students
Career fair opportunities were very good
Small department, get to know everyone, sense of community
Career assistance, Industry Interaction
Construction Club and club activities
Events were very good
Hands-on labs


What do we need to do better/improve (besides courses)?
18
16
14
12
10
8
6
4
2
0
17
10
9
5
5
4
3
Not much to fix
More civil courses and faculty with civil experience
New versions of relevant software
Offer more course times so that scheduling is easier
Computer lab needs upgrading
Per-course faculty
Have more hands-on labs and exercises

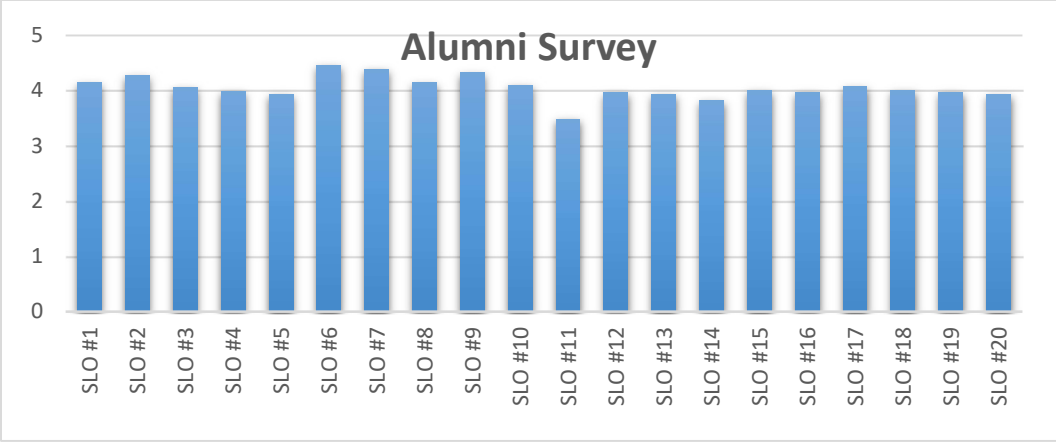




I. Alumni Survey

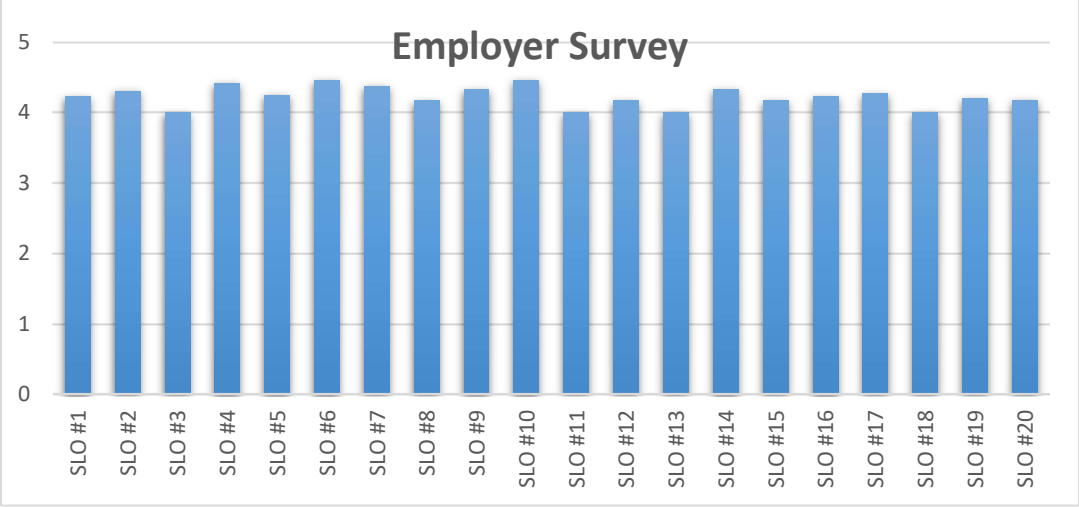
Every five years, recent alumni are asked to complete a survey that assesses their perceived level of preparedness across each of the 20 student learning outcomes. In addition, this instrument also collects information about the overall satisfaction with their undergraduate experience,

perceived department strengths/weaknesses, and contact information. In the most recent cycle (2020), the mean perceived level of preparedness for all SLOs was 4.05/5.00 with a standard deviation of 0.21 points. The figure below shows the distribution of scores for the alumni survey.



J. Employer Survey

Every five years, employers are asked to complete a survey that assesses their level of satisfaction with the preparedness of Missouri State University construction management graduates across each of the 20 student learning outcomes. In addition, this instrument also collects information about the overall likelihood to continue to hire graduates from the MSU CM program, the perceived department strengths/weaknesses, and contact information. In the most recent cycle (2020), the mean level of satisfaction for employers across all SLOs was 4.23/5.00 with a standard deviation of 0.15 points. The figure below shows the distribution of scores for the employer survey.



V. Actions Taken as a result of assessment data collected

The construction management faculty met in Fall 2024 to discuss the findings of the AY 2023-2024 assessment cycle. All ten measures identified in the ACCE self-study were reviewed and discussed. Overall, the CM program appears to be meeting the majority of student and program learning outcomes. Course-level corrective actions are taken anytime a single direct measure falls below the 70% target level detailed in the Assessment Implementation Plan. The CM course

binders contain the instructor course evaluation and improvement plan forms where these actions are documented and tracked.

For the AY 2023-2024 cycle, the faculty first investigated the areas of concern from the AY 2021-2022 cycle and the AY 2022- 2023 cycle. The carryover concern from AY 2021-2022 was: 1) SLO #18 and the number of direct measures meeting the 70% threshold (2021-2022). The carryover concerns from AY 2022-2023 were: 5) SLO #8 and the number of direct measures meeting the 70% threshold; 6) SLO #20 and the number of direct measures meeting the 70% threshold; and 7) SLO #11 and the gap between the student and employer perceptions on level of preparedness.

Regarding concern 1) from AY 2021-2022, 100% of the direct measures for SLO 18 met the 70% threshold. As was previously discussed, the responsible faculty member had planned and implemented changes to the instructional content. Based on the changes, the issue appears to be resolved and is considered closed.

The remaining carryover concerns were from AY 2022-2023. For concern 5) 92% of the direct measures met the required threshold for SLO #8 for the current year. As was previously discussed, there was a new member of the faculty delivering the content and assessment measures. Now that the faculty member is established, the issue appears to be resolved and is considered closed. For concern 6) 63% of the direct measures met the required threshold for SLO 20 for the current year. This was another assessment point that was likely influenced by a new faculty member. The issue appears to be resolved and is considered closed. For concern 7) (SLO11), the gap between student and employer perception of the level of preparedness regarding “surveying knowledge” returned to below the 1.0 maximum. This issue is considered closed, but we will continue to monitor progress.

There are no new areas of concern from the current data cycle. All SLO’s were at or above the 50% threshold for corrective action and student perceptions of SLO mastery were within the 1.0 allowable differential to alumi and employers.

Overall, the construction management faculty are encouraged by the continued growth and development of the program. Enrollment remains strong, the percentage of females in our student population is growing, and we are experiencing strong student engagement beyond the classroom. Our advisory board is engaged, and our industry partners are providing significant financial support to the program. Student placement rates remain near 100%.

In the coming year our focus will be on the following major projects:

- Implement ACCE SLO changes across all courses. Update data collection measures as required. This is a good time to review and update direct and indirect assessment measures as required.
- Implement a new process for CMAB course reviews. We hope to increase participation from our industry partners. We plan to tie the faculty course review cycle to the CMAB course review cycle.
- Implement changes to the CMAB membership structure and meeting formats consistent with the updated bylaws.
- Bring our new building addition online. Faculty will work on strategies to leverage the space for enhanced student learning. We will also look for ways to partner with industry to bring training opportunities to campus.
- Maintain and enhance current fundraising events.
- 5-year data collection from alumni and employers.
- Maintain a high level of student engagement.

VI. Student Achievement

A. Awards and Accomplishments

2024 – Sigma Lambda Chi received a Gold Chapter award for the honor society activities.
2024 – The MEP Club's competition team was recognized in the top 10 in the MCAA National Competition.
2023 – At the Associated Schools of Construction Region 4 Competition, two teams won first place (Design Build & Specialty) and one team was awarded second place (Heavy/Civil).
2023 – The CM worked with campus Design and construction to develop plans for the new addition to Kemper Hall. The project resulted from the award of a $2,000,000 matching MoExcels grant from the State of Missouri for the creation of a construction industry training hub. This grant, coupled with University, College, and private funds will add approximately 10,000 sq. ft. to Kemper Hall.

B. Student scholarships

Missouri State University and industry partners annually award approximately $50,000 in scholarship funds to CM students. On average $15,000 is received externally, on a regional or national level (AGC, DBIA, NAWIC, Builders' Assocation, Springfield Contractors Association, etc.). At Missouri State University, $15,225 was awarded from the College of Business and $11,800 was awarded from the TCM department (MSU total $27,025). The scholarship awards noted here were selected in the spring of 2024 and awarded in the fall of 2024.

VII. Rate and Types of Employment of Graduates

A. Student employment numbers for graduates during AY 2023-2024 including starting salary information.

Type of Employer	No. of Graduates
Commercial GC	37
Specialty Contractor	4
Residential Contractor	6
Heavy/Civil Contractor	10
Industrial	1
Other	0
Total	58

The average starting salary for CM graduates with a position in a related field during AY 2023-2024 was $68,750 (n=56).

VIII. Data to support qualitative claims made by the program

Not applicable.