

**Annual Assessment and Public  
Information Dissemination  
Report for Construction  
Management**

**Academic Year (AY) 2018-2019**



**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: Achieve academic excellence in departmental programs
- TCM Goal 2: Attract and retain quantity and quality of students
- TCM Goal 3: Strengthen community and industry engagement
- TCM Goal 4: Enhance the research environment of the Department
- TCM Goal 5: Support and promote faculty development

## II. Program admission requirements

Students may declare the construction management major 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 direction of assessment committee	Goal 1 Program Outcomes 2,3,6
2	Capstone Course	D	P	Presentation and paper completed by all students in 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 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 end of academic year, placed in departmental office, with Instructor Course Evaluations completed	Spring	Folders are reviewed by department head and department assessment committee with feedback provided to faculty	Department head and curriculum committee formally request course changes and monitor for corrections	Goal 1

4	Advisory Board Course Review	D	C, S	All courses folders are evaluated by advisory board curriculum subcommittee. In 2015 four courses were evaluated.	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 1-5
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 Four 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 Four 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 measures 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 2018, the mean score on the senior exit exam was 58.34% and for spring 2019, the mean score was 59.57%.

### B. *Capstone Course*

#### ***Spring 2019***

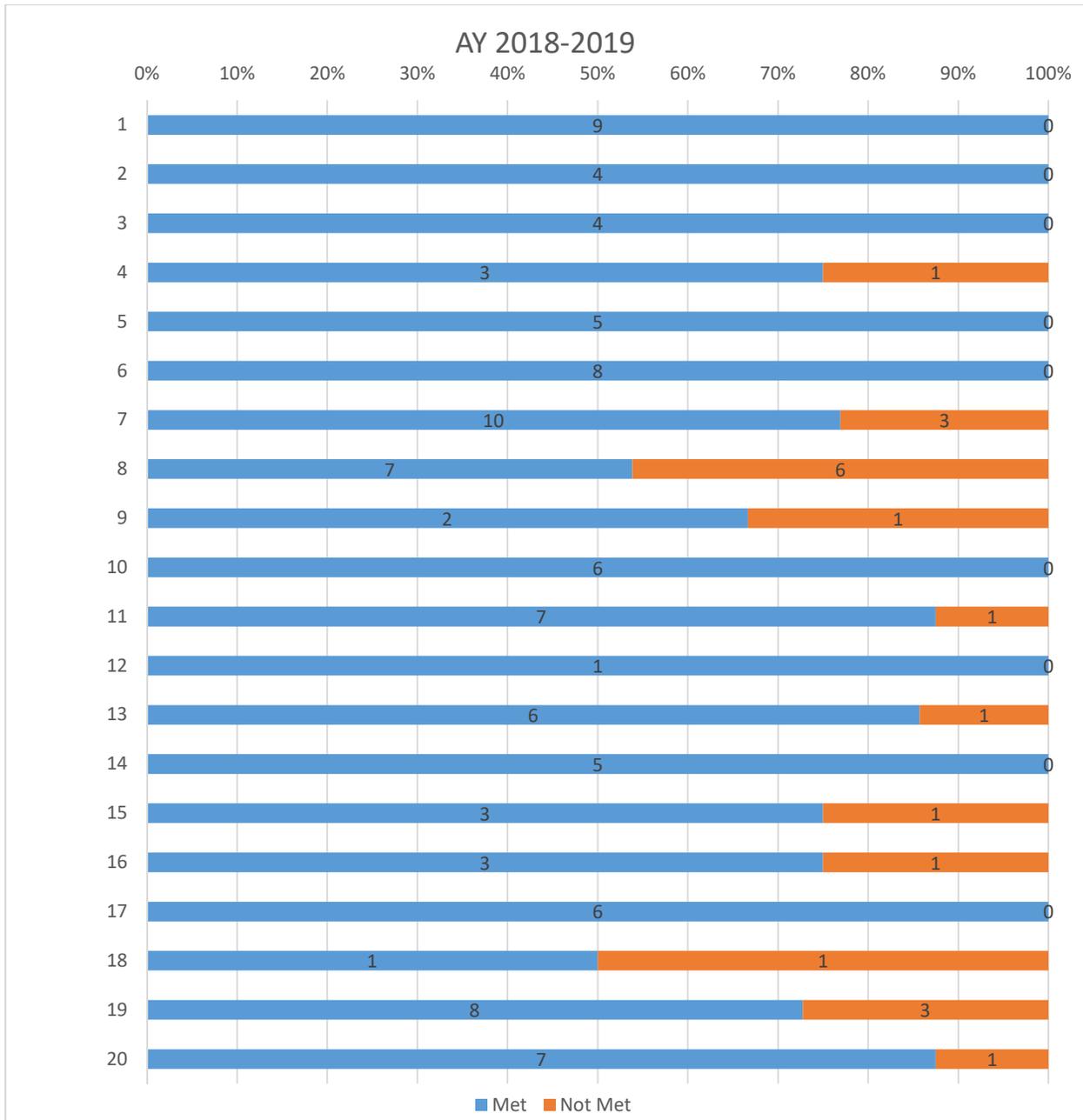
*The smaller, somewhat less complicated projects, “right sized” used in fall 2018, were technically too simple this semester. Neither the credit union nor the clinic had a difficult constructability issue to address. Student teams scored lower on the risk management section of the project execution plan. Both projects where located in areas of high levels of Spanish speaking forces and difficult areas to procure materials in; however, two student teams minimized the potential impact of these risks. The other four teams did not show a complete understanding of the softer, less technical risk issues. Increasing the technical difficulty of the project may provide a defined challenge that students can understand.*

#### ***Fall 2018***

*The smaller, somewhat less complicated project seemed to be within the students’ ability to schedule. Industry comments on the final presentation supported this size project as “right sized” for the student ability. Continue to look for 4,000 to 6,000 square feet buildings with some unusual feature. The project this semester was an Eye Center with a very small site. The difficult feature was associated with deep trench safety, as well as building access prior to basement backfill. Banks and medical clinics may also work well. Overall, fall 2018 schedules and estimates where superior to previous semesters.*

### 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 the majority of 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.



## V. Advisory Board Course Review

During AY 2018-2019, the Construction Management Advisory Board (CMAB) reviewed four courses in accordance with the Advisory Board Course/SLO Review Schedule published in Appendix K of the ACCE Self-Study.

In fall 2018, the CMAB Curriculum Subcommittee reviewed TCM 324 – Construction Estimating and TCM 454 – Construction Safety. A summary of the feedback for each course is listed below:

- TCM 324 – Construction Estimating
  - Appropriateness (4.56/5.00) and Adequacy (4.11/5.00)
  - Improve: 21 comments (291 words)
  - Sustain: 4 comments (30 words)

- Noteworthy:
  - Concept of the estimating process is covered very well.
  - Have students attend pre-job meetings for local projects.
  - Emphasize more on the importance of risk reduction regarding contracting.
  - Cover estimating of General Conditions more deeply.
  - Improve on the RFI process; provide a scenario where students actually write a proper RFI; could be derived from design docs in the assignment.
  - Add a lecture on how to actually DO a take-off and what to look for; wasn't obvious in the course materials.
  - Course reflects a need for technical writing skills. That course isn't a prerequisite.
  - Remember to include modern needs for IT, QA/QC, inspection equipment, DNR/SWPPP.
- TCM 454 – Construction Safety
  - Appropriateness (4.46/5.00) and Adequacy (3.96/5.00)
  - Improve: 30 comments (522 words)
  - Sustain: 5 comments (60 words)
  - Noteworthy:
    - Too little information is provided to have an intro-level employee write a site safety plan.
    - Include indirect costs in the analysis of accidents: loss of production, project stop time, time to conduct investigation, damages, etc.
    - Have students use actual construction documents to create site-specific safety plans, instead of from assignment paragraphs
    - Give students hands-on training with safety tools/equipment.
    - Have students visit local sites to shadow safety managers.
    - Sequence of slides made course difficult to follow; some data mentioned in the schedule seemed to be missing from materials.
    - Much material seemed general. While intended, it may lose the interest of the CM students.
    - Expand on fall protection systems to include railings raptor cards, fall-arrest systems, and floor holes.
    - Discuss generalized job site procedures on how to handle an OSHA visit. It will vary by-company, but is important for all to recognize.

In spring 2019, the CMAB Curriculum Subcommittee reviewed TCM 320 – Construction Contracts and TCM 321 – Mechanical Systems for Buildings. A summary of the feedback for each course is listed below:

- TCM 320 – Construction Contracts (9 reviews)
  - Appropriateness (4.69/5.00) and Adequacy (4.67/5.00)
  - Improve: 17 comments (437 words)
  - Sustain: 19 comments (281 words)
  - Noteworthy:
    - Very thorough and complete course layout that includes very good definition of contract types, contract risks, and risk management.
    - Great information in the Indemnities & Risk Management section
    - Great explanations of 'why' so much documentation must be created and retained!
    - This looks like a great course, and the instructor has made it look fun.
  - Recommendations

- It would be beneficial for students to see an actual contract so they can learn the differences between general inclusions and scope specific inclusions
  - Emphasize the fact that all aspects of contracts are only a component of the risk management that occurs throughout a project's lifecycle.
  - The course could spend more time talking about project specifications.
  - Create some checklists that drafters or reviewers of small contracts might find useful
- TCM 321 – Mechanical Systems for Buildings (7 evaluations)
  - Appropriateness (4.26/5.00) and Adequacy (3.94/5.00)
  - Improve: 18 comments (509 words)
  - Sustain: 9 comments (207 words)
  - Noteworthy:
    - This course covers a tremendous amount of material and basic calculations of heat loss and gains along with other basic concepts for mechanical systems.
    - Course is much better prepared than it was many years ago.
    - The use of design drawings, as they would appear from the engineers for a project, is very useful to exemplify where the various systems appear in projects.
    - Quizzes and final exam seem to be detailed enough to require deep reading of the materials, and paying attention to the lectures, to ensure the correct answers can be found.
  - Recommendations:
    - Publish a glossary for the students to better understand the vocabulary specific to this course. Some terms may be confusing if students have a background in a different industry.
    - Provide a broader overview of the systems prior to deep diving into plans and specs.
    - A tremendous amount of HVAC options exist to introduce to students, such as Chilled Beams, Radiant Panel Systems, Geothermal, VRF systems, etc. Sustainable design is driving many of these into the design and construction of new and renovated buildings to meet new energy codes.
    - Seems like a lot of ground to cover for a one-semester course. Grads need a good 'basic' understanding of mechanical/electric systems. Maybe reduce some of the 'engineer' content.

## A. *Strategic Plan Progress Reviews*

Goals and objectives of the department and the construction management degree program are listed below. Strategies are indicated under each related objective with yearly updates as applicable.

### *Goal 1: Achieve Academic Excellence in Departmental Programs*

#### **Departmental Objectives:**

- 1.1 Encourage and support accreditation of departmental programs
  - 1.1.1 ACCE re-accreditation 2016
    - February 2017: Successfully completed; continue to follow through on updates and interim reports
    - August 2019 – Collect alumni and employer survey data needed for ACCE during 2019-2020

- 1.1.2 PMI re-accreditation 2019
- 1.1.3 ABET accreditation for MET in 2019 (begin preparation in 2016) ABET accreditation preparation has begun - drafts of program educational objectives, student outcomes, and performance indicators have been generated as of December 2015
- 1.1.4 Explore possibility of CIDA accreditation and decide by May 2016
- 1.2 Maintain up-to-date and relevant laboratories, equipment, and software
  - 1.2.1 Conveyor, surveying equipment repair, 2nd plan box, etc.
    - August 2016: Conveyor, plan box purchased and surveying equipment repaired as of summer 2015; Conveyor installed as of December 2015
    - August 2017: MEP lab updates in progress; HVAC ductwork and equipment donated.
    - August 2018: MEP lab growth continues (Nelson successful with equipment grant); competition computers obtained; space swap with CNAS in progress and scheduled for completion in Summer 2019
    - August 2019: Space swap was completed. Equipment grant for Spyder crane was successful. Delivery of equipment should be during AY 2019-2020
  - 1.2.2 Robotics purchase, etc. 2016
  - 1.2.3 Develop a coordinated plan for lab and equipment use (Joswick and committee, December 11, 2015) (committee formed August 2015)
- 1.3 Maintain a faculty that is current on the latest and most relevant teaching topics and methods
  - 1.3.1 Target 1 faculty presentation on technical or academic developments each semester starting fall 2015 (Callahan) – Continue to spring 2016
    - August 2016: completed – Mehany; Continue to Spring 2017
    - August 2017: completed – Bezhadan graduate student; continue to Spring 2018
    - August 2018: completed – Sauer & Nelson presented use of laser scanning in class
    - August 2019: completed – Perspective faculty candidates presented including Dr. Peterson on drones.
- 1.4 Develop a more diverse department
  - 1.4.1 Encourage student diversity by participating in at least one targeted event or activity per year
    - April 2016: a record 2,983 middle and high school students attended the event in Kansas City
    - April 2017: Participated in 1<sup>st</sup> Annual Build My Future event in Springfield targeting high potential regional students
    - August 2018: Participated in 2nd Annual Build My Future event in Springfield targeting high potential regional students; more than 1200 students present
    - August 2019: Participated in 3rd Annual Build My Future event in Springfield targeting high potential regional students; more than 1800 students present. Also, attended iBuild in KC – participants were a diverse group of high potential students; more than 1200 participated.

**Construction Management Program Objectives:**

- 1.1 CM - Offer programs and opportunities that stimulate interest and grow the CM program
  - 1.1.1 Maintain ACCE accreditation and evaluate alternatives (May 2016) (CM faculty attended the annual and mid-year ACCE meetings.



- 1.4 CM - Infuse a multidisciplinary perspective across the curriculum
- 1.4.1 Increase the opportunities for CM, FM, and ID students to work together on cross-disciplinary projects. (May 2017)
- August 2017: FM program was deleted. ID students are still highly integrated in CM courses and look to make more contributions/interactions in upcoming ASC competition teams.
- 1.5 CM - Obtain feedback on how we can improve the quality of graduates.
- 1.5.1 Survey advisory board members and primary employers every four (4) years to determine their level of satisfaction with quality of CM student and their level of preparation. (AY 2015-16)
- August 2016: Completed in fall 2015, Results of all surveys analyzed as part of annual retreat in August 2016
  - August 2018: Completed in fall 2015, Results of all surveys analyzed as part of annual retreat in August 2018
  - August 2019: Need to complete this AY.
- 1.5.2 Every four years, survey CM graduates who have been in the workforce for at least one (1) year regarding their satisfaction with their academic preparation from the program. (AY 2015-16)
- August 2016: Completed in fall 2015, Results of all surveys analyzed as part of annual retreat in August 2016
  - August 2018: Completed in fall 2015, Results of all surveys analyzed as part of annual retreat in August 2018
  - August 2019: Need to complete this AY.
- 1.5.3 Survey graduating seniors every semester regarding their satisfaction with their academic preparation from the program. (ongoing)
- December 2015: Converted to online survey
  - August 2016: Completed all surveys and analyzed as part of annual retreat in August 2016
  - August 2017: Completed in each semester this academic year. Results were discussed in August 2017 CM retreat
  - August 2018: Completed in each semester this academic year. Results were discussed in August 2018 CM retreat
  - August 2019: Completed in each semester this academic year. Results were discussed in August 2019 CM retreat

## ***Goal 2: Grow enrollment – attract and retain quantity and quality of students***

### ***Departmental Objectives:***

- 2.1 Develop and maintain a departmental website that effectively helps with student recruitment
- 2.1.1 Form TCM website development committee (Callahan, fall 2015)
- August 2015: Committee formed; maintenance program delegated to individual program coordinators
- 2.2 Develop and strengthen relationships with community colleges (articulation agreement with East Central C.C. in progress fall 2015, MET program)
- August 2017: Contact made with State Fair Community College, an ACCE 2-year program, to begin articulation agreement process
  - August 2019: A 1+3 program with State Fair CC was mapped out and presented. Follow up with State Fair is needed to see if this is beneficial.
- 2.3 Develop and maintain printed material
- 2.3.1 Select a departmental folder and have a supply available to hold departmental literature for recruiting and informational purposes (Callahan and staff, August 2015)
- August 2015: Completed 1000 folders

- 2.4 Strengthen relations with MSU Admissions and Advising
  - March 2016: Met with university advisors for non-declared majors
  - August 2017: Target Kathy J. Davis, Director, Academic Advisement Center, on featured major posters for AY 17-18

**Construction Management Program Objectives:**

- 2.1 CM - Attract and retain high potential students
  - 2.1.1 Implement student recruitment and retention plan (with student input) by August 2017.
    - August 2017: met with Melissa Price on possible recruiting idea in summer – need more effort and action; investigate living-learning communities; complete by August 2018
    - August 2018: Formal recruitment and retention plan started; target final completion by Spring 2019
    - August 2019: Formal recruitment and retention plan needs more work. Push completion date to Spring 2020.
  - 2.1.2 Participate in four major recruiting events (ongoing)
    - August 2016: iBuild, Bearfest, MBU, and Industrial Arts Competition (MBU and Bearfest Village complete – December 2015) (iBuild and Industrial Arts Competition – May 2016)
    - August 2017: Build My Future, Bearfest, Industrial Arts Competition, and MoACTE teachers conference on campus; majors fair; FanFest
    - August 2018: ACE Mentor Program; Build My Future, Bearfest, Industrial Arts Competition, and MoACTE teachers conference on campus; majors fair; FanFest
    - August 2019: ACE Mentor Program; Build My Future, iBuild, Bearfest, Industrial Arts Competition, majors fair, and FanFest
  - 2.1.3 Implement a scholarship program for incoming students (August 2019)
    - August 2018: While not specifically targeting incoming students, the CMAB established a \$2000 scholarship for the next 5 years with the goal of finding endowed funding by the end of that period.
  - 2.1.4 Continue to investigate and develop long-term recruitment strategies
    - 2.1.4.1 PLTW (May 2016)
      - August 2016: not complete; Move to May 2019
      - August 2019: PLTW for CM appears to be losing steam. However, CM Faculty serve on the advisory board for the SPS Technology and Design Academy. This may serve as an excellent conduit for students into the program. Consider revising this objective in next strategic plan iteration.
    - 2.1.4.2 CTCs (May 2017)
      - August 2017: Hosted MoACTE teachers on campus to make them aware of program and its opportunities. Small turnout, but future potential should be investigated in the recruitment and retention plan.
      - August 2018: Featured speaker for MoACTE construction teacher track. Small turnout, but future potential should be investigated in the recruitment and retention plan.
    - 2.1.4.3 Specific high schools, etc. (May 2020)
      - August 2018: MSU was an active sponsor of the ACE Mentor program in Springfield. Students not only toured the facilities, but their final presentations were also in Glass Hall.
      - August 2019: MSU was again an active sponsor of the ACE Mentor program in Springfield.
  - 2.1.5 Grow number of endowed student scholarships.

- August 2017: Bailey scholarship received and recognized; continue efforts moving into AY 2017-18
    - August 2018: While not yet endowed, the CMAB established a \$2000 scholarship for the next 5 years with the goal of finding endowed funding by the end of that period.
  - 2.1.6 Investigate MSU's "crowd funding" tool as a way to develop a Construction Club endowed scholarship fund (May 2016) -Move to May 2017
    - August 2017: Attended MSU Foundation workshops on crowdfunding; after meeting with foundation staff, recommend this effort remain "on tap" when right effort arises; Continue investigation into May 2020
- 2.2 CM - Offer programs and opportunities that stimulate interest and grow the CM program
  - 2.2.1 Increase student extracurricular involvement in student organizations (ongoing)
    - August 2016: Tracking began fall 2015; compare year-over-year numbers ongoing as part of annual retreat in August 2016
    - August 2017: During annual retreat analysis, realized that tracking was not as detailed in AY 2016-2017; Need to investigate better options to collect data by May 2018
    - August 2018: Students leaders attended AGC Annual Meeting in New Orleans. Students also were actively engaged in multiple ASHRAE and MCA events around the country. Student engagement appears to be on the rise, but tracking data is still an issue. Student groups were able to collect meeting attendance each semester, but names and hours of students working on extracurricular events was not as detailed. New push this year will focus on getting underclass (especially those in TCM 121 and TCM 221) engaged in club activities early in the fall semester.
    - August 2019: Students leaders attended AGC Annual Meeting in Denver. Students also were actively engaged in multiple ASHRAE and MCA events around the country. Student engagement appears to be on the rise, but tracking data is still an issue. Efforts to focus on getting underclass involved seem to be working.
  - 2.2.2 Investigate the possibility of adding course offerings to increase concentration areas (May 2018)
    - August 2018: Concentration areas were deleted because of feedback from students and employers. In addition, faculty noted that students were not taking full advantage of the different areas. Approved program changes now require BIM, Soft Skills, and an advanced MEP course instead of the 9 hours of emphasis.

### ***Goal 3: Strengthen Community and Industry Engagement***

#### ***Departmental Objectives:***

- 3.1 Strengthen advisory boards and promote advisory board coverage of all programs
  - 3.1.1 CM Advisory Board (ongoing, Callahan and CM faculty)
  - 3.1.2 MET Advisory Board (form by June 2016, Callahan and MET faculty) - Ongoing: Spring 2016: A list of corporate targets has been generated.
- 3.2 Increase industry participation in the career fair and other means of recruiting for all TCM programs (ongoing): Career Fair 2014 – 28 companies, 2015 – 40

companies, 2016 – 37 companies; 2017 – 41 CM companies; 2018 – 35 companies

- 3.3 Support the University's Public Affairs Mission by leading and participating in community engagement and/or service events
- August 2018: CM program built a pergola-type structure for the Betty and Bobby Allison Dream Center. Students were also engaged in multiple other smaller-scale projects throughout the school year (see 3.3.3 below).

**Construction Management Program Objectives:**

- 3.1 CM - Improve and enhance communications with alumni, the CM community, and friends and supporters of the program
- 3.1.1 Increase the number of alumni participating in the annual golf tournament (ongoing) (24 companies (primarily alumni players) participated in the May 2016 tournament – largest to date); 2018 – Maxed out course single flight limit of 104 players.
- 3.1.2 Hold at least one alumni event each year (alumni gala or other???)
- February 2016: alumni event at men's basketball game
  - February 2017: alumni event at men's basketball game
  - August 2018: alumni event at men's basketball game; alumni fall golf tournament; alumni party after spring golf tournament; alumni event in STL
  - August 2019: alumni event at men's basketball game; alumni fall golf tournament; alumni event in STL & KC
- 3.1.3 Explore ways to regularly communicate with alumni (social media, newsletters, etc.) (May 2016)
- August 2016: (social media efforts and newsletters continue; efforts will continue and due date on this activity should extend potentially 2 years to coincide with work of advisory board on alumni relations)
  - August 2017: First newsletter published in Spring 2017; publication to be a twice per year event assisted by CMAB
  - August 2018: Two newsletters published in 2017-18; publication to be a twice per year event assisted by CMAB
  - August 2019: Two newsletters published in 2018-19.
- 3.2 CM - Grow and develop CM advisory board
- 3.2.1 Increase membership in advisory board by one (1) company each year (ongoing)
- August 2016: Completed – 3 companies added
  - August 2017: Completed – 1 company added
  - August 2018: Completed – 2 companies added; 1 honorary member added
  - August 2019: Completed – 1 company added
- 3.2.2 Implement sub-committees to the advisory board to spread the workload and maintain engagement throughout the year (May 2017)
- August 2017: Completed – Bylaws changed and four (4) new subcommittees very active
- 3.2.3 Institute a young alumni track for recent graduates to become involved (May 2017)
- August 2017: Completed – one subcommittee of CMAB dedicated to this effort; continue to 2020
- 3.2.4 Review advisory board bylaws (May 2016) (A very productive spring advisory board has begun review of bylaws in coordination with strategic planning efforts for the board. Final draft of revised bylaws should be voted upon in May 2017.)
- August 2017: Completed – Bylaws changed and approved
  - August 2018: Revision made to add honorary language

- 3.2.5 Encourage CM advisory board member(s) to participate in ACCE activities (December 2015)
  - August 2017: Completed – CMAB president attended ACCE IAB event in February
  - August 2018: Completed – CMAB president & VP attended ACCE IAB event in February
  - August 2019: two CMAB members attended February event (Tim & Tim)
- 3.3 CM - Support MSU's Public Affairs Mission
  - 3.3.1 Host Boy Scout Merit Badge University
    - August 2015: Completed 2014
    - August 2016: Completed 2015
    - August 2017: Completed 2016
    - August 2018: MBU has ended for now
  - 3.3.2 Periodically undertake major public affairs project (May 2017)
    - August 2017: no significant project identified; continue to May 2018
    - August 2018: Pergola-type structure built for Betty & Bobby Allison Dream Center
  - 3.3.3 Engage faculty and students in community service by targeting 3 different activities each year (ongoing)
    - August 2015: Adopt-a-street, food bank, SCA Chicken BBQ, (Completed adopt-a-street, SCA Chicken BBQ, Sammy's Window, and Operation Christmas Child
    - August 2016: ramp build, pinewood derby build day; Gen Next Bass Bash events; SCA chicken BBQ and Pig Roast
    - August 2017: Operation Christmas child, pinewood derby build day; Gen Next Bass Bash events; SCA chicken BBQ and Pig Roast; Bass Pro Marathon
    - August 2018: Operation Christmas child, pinewood derby build day; Gen Next Bass Bash events; SCA chicken BBQ and Pig Roast; Bass Pro Marathon; Betty and Bobby Allison Dream Center Pergola; NAWIC Block Kids Judging; Toys for Tots;
    - August 2019: Operation Christmas child, pinewood derby build day; Gen Next Bass Bash events; SCA chicken BBQ; Bass Pro Marathon; NAWIC Block Kids Judging; Toys for Tots; ACE Mentor Program; adopt-a-street; and Holland Elementary
- 3.4 CM - Grow the reputation of the CM program through professional engagement
  - 3.4.1 Encourage faculty to hold regional, national, and international officer positions within professional organizations (ongoing)
    - August 2016: Gebken held Board positions with ASC and Sigma Lambda Chi; Mehany elected to research committee vice-chair; Behzadan served as ASCE CIMS committee secretary and ASCE JCEM special editor on quantitative methods)
    - August 2017: Gebken held Board positions with ASC and Sigma Lambda Chi; Mehany served on ASC committee; Behzadan served on ASCE Journal boards
    - August 2018: Gebken held Board positions with ASC and Sigma Lambda Chi; Nelson held regional position with ASC and ASHRAE
    - August 2019: Gebken held Board positions with ASC and Sigma Lambda Chi; Nelson held regional position with ASHRAE
  - 3.4.2 Develop Missouri Construction Hall of Fame and induct first group (May 2020)
- 3.5 CM – Increase student success in job placement

- 3.5.1 Increase the number of employers participating in the Career Fair from prior year. (ongoing): 2014 – 28 companies, 2015 – 40 companies; 2016 – 37 companies; 2018 – 41 companies
- 3.5.2 Investigate the possibility of holding an additional spring career fair event (with student input). (December 2015)
  - o August 2016: 10 construction companies and approximately 50 students attended the all-university career fair event in the spring semester. This event will be encouraged for both employers and students as hiring trends continue upward.
  - o August 2017: Students and companies were again encouraged to attend the spring all-university career fair. Accurate data on company and student attendance was not collected; improve for AY17-18.
  - o August 2018: Students and companies were again encouraged to attend the spring all-university career fair. Tracking of this event is not a priority currently. Suggest re-evaluating this strategy in the next strategic plan.
- 3.5.3 Increase student participation in the Career Fair from prior year. (ongoing): 2014 – 84, 2015 – 110; 2016 – data not collected; 2017 – 132; **2018 - 145**
- 3.5.4 Personally visit 2 employers each year who either do not or have not recently recruited at MSU to grow number of employers on campus. (ongoing)
  - o August 2016 - Visited Murphy Mechanical and Clayco on our spring field trip. Also visited Gold's Mechanical and SECO offices in town
  - o August 2017 – Visited Hoar Construction, Walsh, and Alberici during spring field trip
  - o August 2018 – Visited with Paric Construction and Garney Construction
  - o **August 2019 – Visited with Newkirk Novak and Hartmann Construction**

***Goal 4: Enhance the research environment of the program***

***Departmental Objectives:***

- 4.1 All TCM tenured or tenure track faculty members maintain SA status as required by the College of Business
  - 4.1.1 Promote collaborative writing/multiple authorships within the department
    - 4.1.1.1 Schedule departmental meeting to discuss collaborative research (Callahan, October 2015)
  - 4.1.2 Promote collaborative writing across multiple disciplines/institutions
- 4.2 Develop a research focus area that could support participation from all TCM programs
- 4.3 Reposition C-PRIME to strengthen its platform for supporting externally funded research
  - 4.3.1 Redefine C-PRIME's mission by May 2016 after assessing current and new faculty members' strengths and interests. Update: Dr. Behzadan appointed C-PRIME director spring 2016. Initial thoughts on new vision presented to faculty May 2016.

***Construction Management Program Objectives:***

- 4.1 CM - Increase the amount of funded research
  - 4.1.1 Increase the number of co-authored papers by faculty members (ongoing) –
    - o August 2017 – Mehany, Gebken – 1 journal, 1 conference; Behzadan – 2 journal articles, 4 conference papers

- August 2018 – Gebken, Sauer -> 1 conference paper & 1 journal article; Nelson -> 2 conference papers
  - 4.1.2 Secure \$250,000 funding for grants or research projects by May 2020
    - August 2016: Completed - Dr. Behzadan - Approximately \$300,000 from NSF grants
  - 4.1.3 Enhance relationships with potential funding agencies (May 2018)
    - August 2018 – faculty changes have pushed this a strategy; reevaluate in August 2019
    - August 2019 – Dr. Peterson was hired and shows an interest in this area. Coordinate direction with feedback from Jim.
- 4.2 CM - Develop resources needed to facilitate research
  - 4.2.1 Increase student involvement in research by involving 5 undergraduate students in research projects by May 2018
    - August 2018 – faculty changes have pushed this a strategy; reevaluate in August 2019
  - 4.2.2 Acquire additional research equipment
    - August 2016: 3-D Laser Scanner in May 2016
    - August 2017: VR headset acquired by Dr. Behzadan; Mechanical equipment received for MEP lab and possible research; continue into 2018
    - August 2018 – MEP lab equipment grant funded (Nelson); new equipment should help both research and classroom activities

## ***Goal 5: Support and Promote Faculty Development***

### ***Departmental Objectives:***

- 5.1 Develop faculty members who are current and engaged in their academic areas
  - 5.1.1 Fund and encourage participation in professional organizations, conferences, and other professional endeavors
  - 5.1.2 Encourage faculty members to pursue leadership roles in regional and national professional organizations (goal: at least 1 faculty member from each program in a regional or national office, position, or committee by May 2017)
- 5.2 Implement faculty mentoring and development program
  - 5.2.1 Assign newly hired faculty a mentor within one month of hire
  - 5.2.2 Provide opportunities /resources for faculty internships and short courses
    - 5.2.2.1 Present Information to the TCM faculty relating to the AGC faculty internship and other opportunities (Dr. Mehany, August 2015; Dr. Sauer & Dr. Hari, August 2018)

### ***Construction Management Program Objectives:***

- 5.1 CM - Grow Endowed chairs for faculty
  - 5.1.1 Seek funding for new endowed professorship (May 2020)

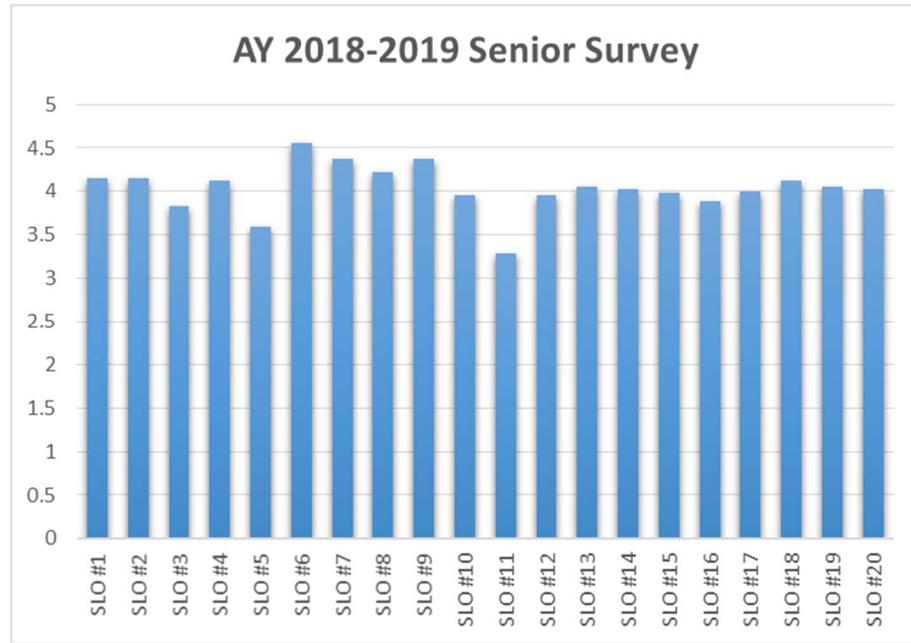
## ***B. Course Evaluations***

For AY 2018-2019, the mean and median student evaluation of teaching score for CM courses was 4.35/5.00. The standard deviation for the same time period was 0.31 points. The mean student evaluation of teaching score for the Technology and Construction Management department was 4.23/5.00 with a standard deviation of 0.41.

## ***C. 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 2018-2019, the mean perceived level of preparedness for all SLOs was 4.03/5.00 with a standard deviation of 0.27 points. The figure below shows the distribution of scores for the senior exit surveys. SLO #11 (surveying) appears to be significantly lower than other areas and will be discussed in section five.



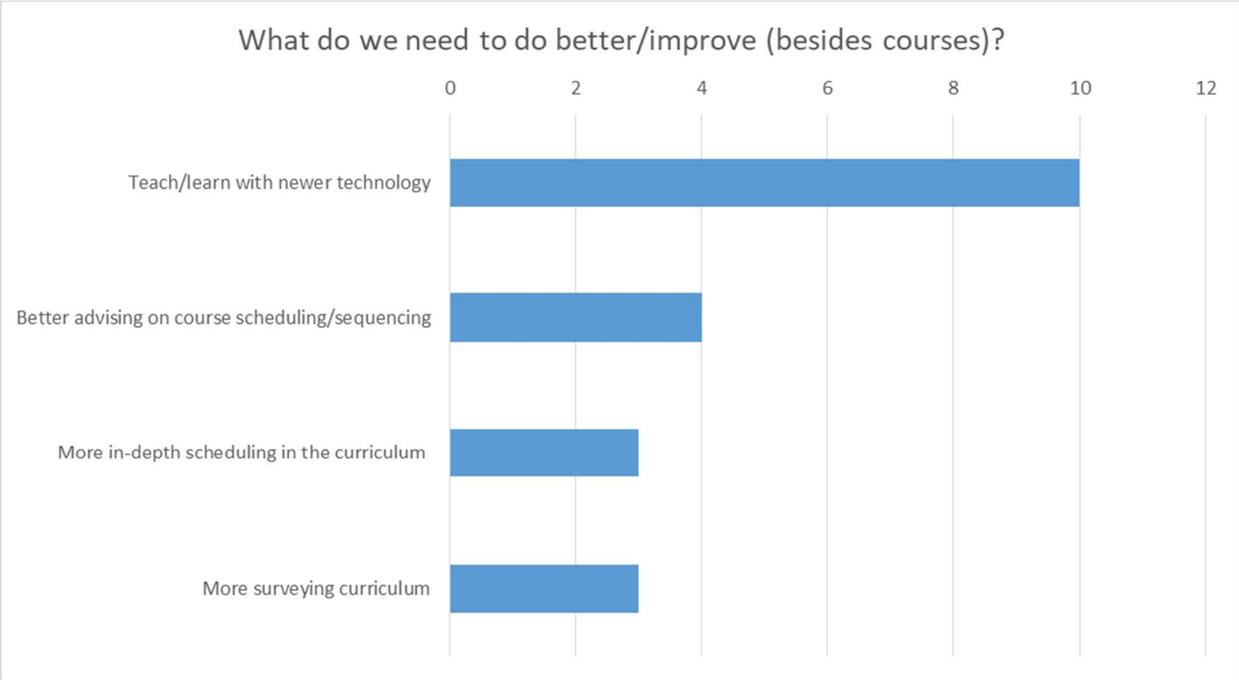
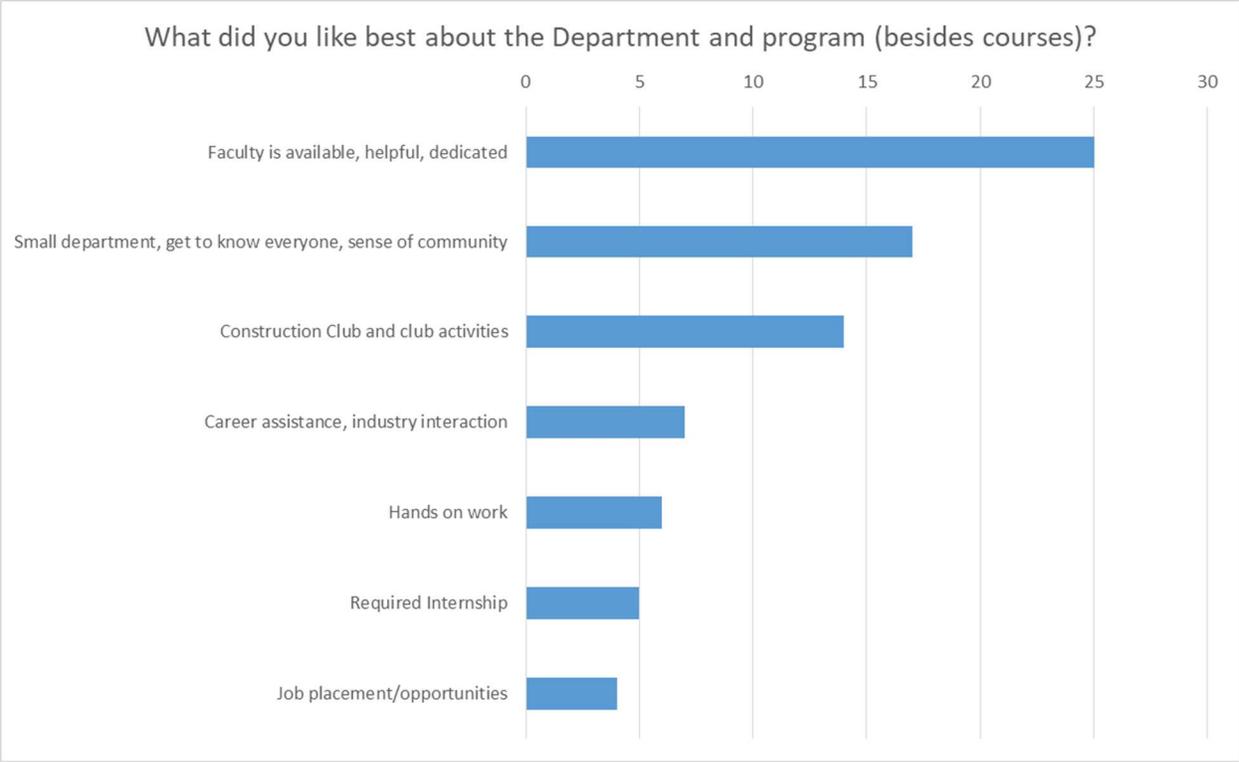
#### D. *Senior Exit Interview*

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

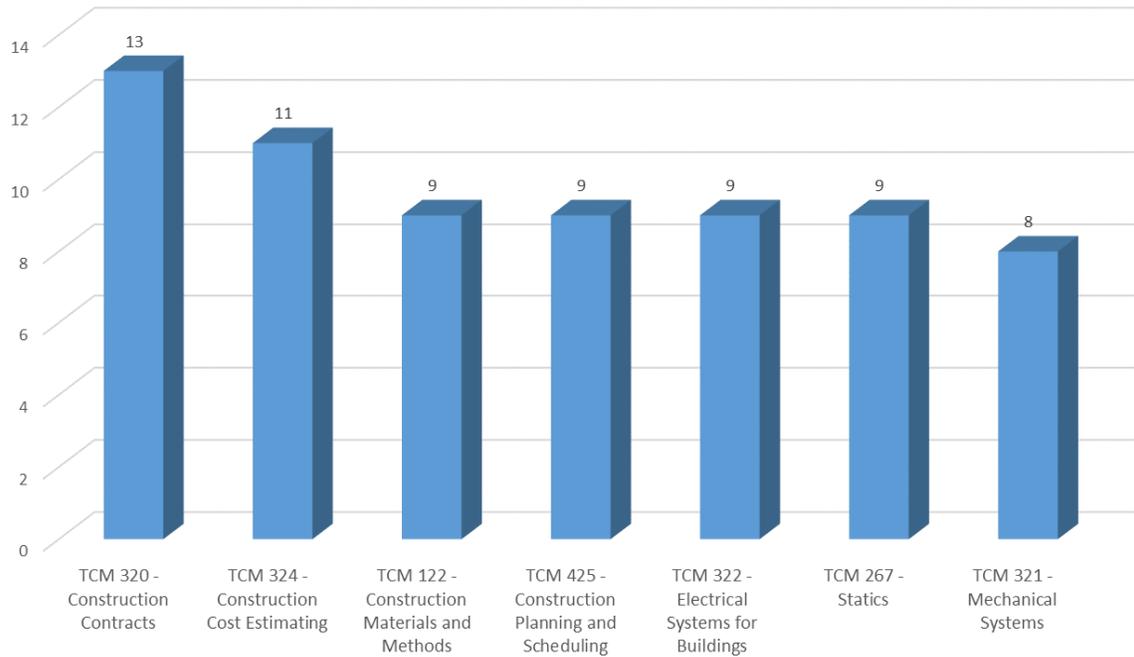
1. What did you like best about the Department and program (besides courses)?
2. What do we need to do better/improve (besides courses)?
3. What courses did you learn the most in or like the best?
4. What courses do we need to improve?

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

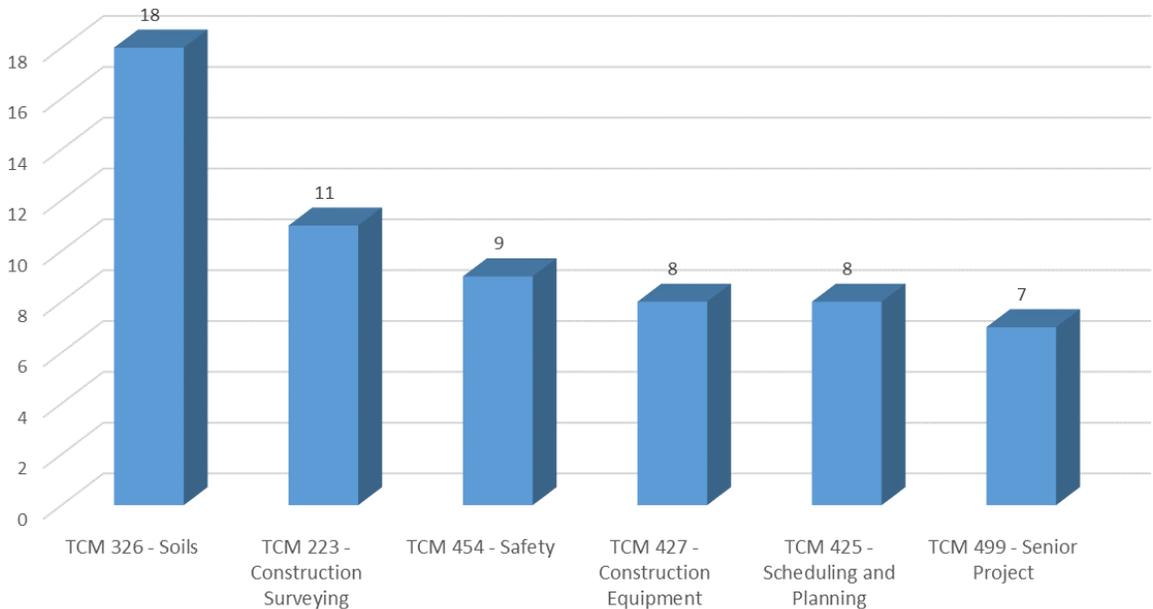
#### **Fall 2018/Spring 2019**



### What courses did you learn the most in or like the best?



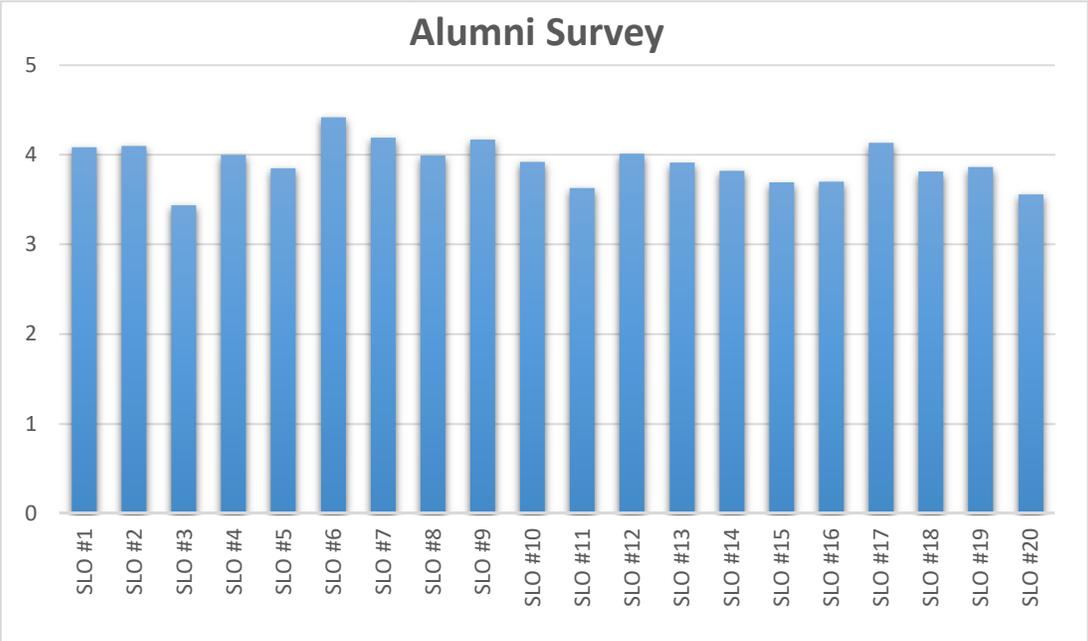
### What courses do we need to improve?



### E. *Alumni Survey*

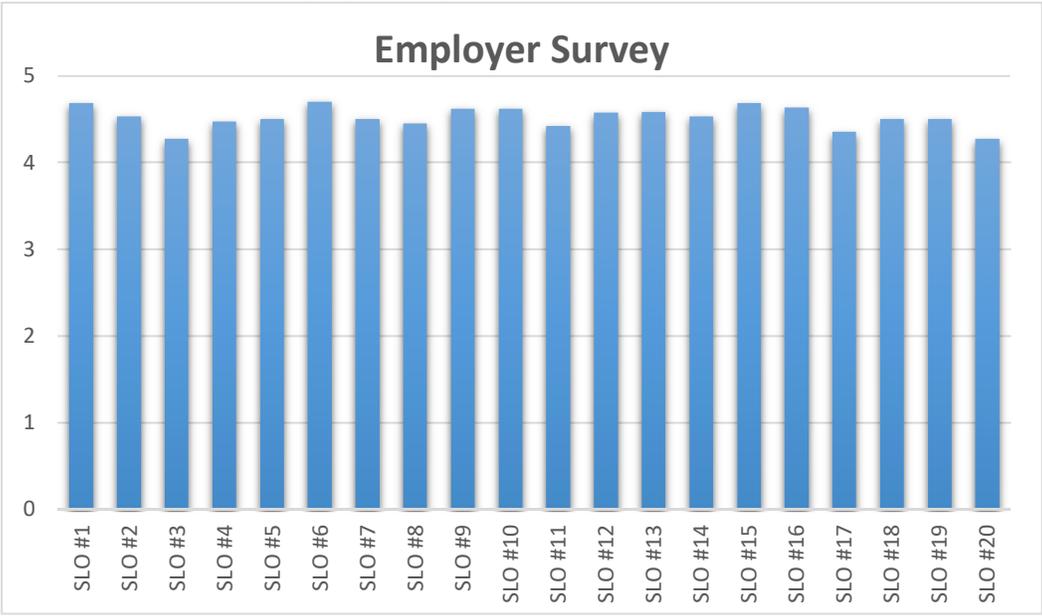
Every four years, recent alumni are asked to complete a survey that assesses their perceived level of preparedness across each of the 20 student learning outcomes. In addition, this instrument also collects information about the overall satisfaction with their undergraduate experience, perceived department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

recent cycle (AY 2015-2016), the mean perceived level of preparedness for all SLOs was 3.92/5.00 with a standard deviation of 0.24 points. The figure below shows the distribution of scores for the alumni survey.



**F. Employer Survey**

Every four 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 (AY 2015-2016), the mean level of satisfaction for employers across all SLOs was 4.52/5.00 with a standard deviation of 0.12 points. The figure below shows the distribution of scores for the employer survey.



## VI. Actions Taken as a result of assessment data collected

The construction management faculty met in August and October 2019 to discuss the findings of the AY 2018-2019 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 fall 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 2018-2019 cycle, the faculty first investigated the areas of concern from the AY2017-2018 cycle and any other open issues from earlier reports. These items included: 1) the significant drop in perceived student ability to create construction project schedules; 2) SLO #18 (Understand the basic principles of sustainable construction) had equal or more direct measures fail to meet rather than meet the 70% target level; 3) the search for a quality faculty candidate; and, 4) improving printing capabilities in both Kemper 105 and Kemper 207. On issue #1, performance of students on scheduling tasks seems to be improving. Feedback from multiple assessment measures, including senior project presentations, showed marked improvement. For issue #2, the most recent data still indicate that this is an area where little improvement has been made (assessment questions show students are split on their ability to demonstrate successful outcome achievement). Since SLO #18 is an area where there are only two direct measures of student learning outcomes exist, this topic should be addressed before the next accreditation cycle to ensure adequate coverage and assessment within the curriculum. For issue #3, Dr. Jim Peterson was hired!!! This should help to minimize per-course faculty issues that have been present for several years and help strengthen the program in multiple areas. Lastly, on issue #4, Kemper 105 was moved into a renovated space in Kemper 126. This new space is outstanding and will be an asset to the department for years to come. As part of this move, the printing equipment was upgraded. The next target area will be Kemper 207 when funding becomes available. Continue progress monitoring into AY2019-2020.

Only one new area of concern was identified during the August/October 2019 meetings – this was the need to improve soft skills education for students. Based upon faculty and CMAB input, coupled with findings from visits to internship sites, the need to integrate more soft skills content was deemed critical. As such, the faculty initiated a CM program change that would do the following: 1) eliminate the “emphasis” areas from the degree program (to free up credit hours for other course changes); 2) add a course focused on soft skills (TCM 401); 3) require TCM 313 for all students (faculty and CMAB input pointed towards BIM becoming more critical to graduate success); 4) require either TCM366 or TCM 424 for all students(done to help strengthen our program’s commitment to MEP systems) 5) eliminate TCM 359 from the program requirements (the combination of an online format, weak per-course instruction, a generic industry approach, and content repetition from other required courses were the motivating factors); and, 6) redistribute hours to TCM 499 to make it more reflective of the time and effort students put towards this class (ultimately, this will reduce total required hours to 125). CM faculty will need to re-examine the SLO’s included in TCM 359 to see how they will be addressed in the new program of study. Likewise, the faculty must examine TCM 313 and TCM 401 for SLO assessment possibilities.

Overall, the construction management faculty are encouraged by the continued growth and development of the program. Improvements within the CMAB and positive industry growth are all signs that the program will continue its success in the coming years.

## VII. Student Achievement

### A. Awards and Accomplishments

2019 – The Construction Club was recognized as a “top 10” within the AGC of America’s student chapter competition. As such, students were invited to host a display table at the convention in Denver, CO.

2019 – The MEP Club was again awarded multiple grants from ASHRAE and MCA for its student group and additional MEP lab equipment.

2018 – At the Associated Schools of Construction Region 4 Competition, the design/build team placed 3<sup>rd</sup>, the commercial renovation team placed 1<sup>st</sup>, and the specialty teams placed 1st.

### B. Student scholarships

The department and local industry annually award approximately \$30,000 to CM students. On average \$12,000 has been received by CM students on a regional or national level by CM students. The list of university-housed scholarships, awards, and annual award amounts are listed below.

Scholarships	Amount
Bailey Family Construction Management Scholarship	1000
Construction Management Advisory Board Scholarship	2000
Doyle Kemper Memorial Scholarship	1000
EFCO Corporation Scholarship	1000
Howard Moore Group, Inc. Scholarship	500
James W. Gardner, Jr. Memorial Scholarship	500
JE Dunn Construction Scholarship	1000
Missouri Concrete Association (MCA) Scholarship	500
Orin R Robinson Scholarship	500
Roger G. Killian Memorial Scholarship	1000
S. Strong Memorial Scholarship	500
S. Strong Memorial Scholarship	500
Springfield Contractors Association Scholarship	523.32
Technology and Construction Management Department Scholarship	600
Technology and Construction Management Department Scholarship	500
Technology and Construction Management Department Scholarship	600
Technology and Construction Management Department Scholarship	600
Technology and Construction Management Department Scholarship	600
Ted Smith Endowment Scholarship	1000
Wilbur Shank Memorial Scholarship	600
<b>Total</b>	<b>\$ 15,023</b>

## VIII. Rate and Types of Employment of Graduates

### A. *Student employment numbers for graduates during AY 2018-2019 including starting salary information.*

Type of Employer	No. of Graduates
Commercial GC	22
Specialty Contractor	3
Residential Contractor	1
Heavy/Civil Contractor	9
Total	35

The average starting salary for CM graduates with a position in a related field during AY 2018-2019 was \$58,913 (n=32).

## IX. Data to support qualitative claims made by the program

Not applicable.