PURDUE UNIVERSITY

School of Construction Management Technology
POLYTECHNIC INSTITUTE

Construction Management Technology Program Assessment Plan

Document Outline:

I. School and Program Guiding Principles (Vision, Mission, Strategic Plan (Core Values), Goals, Undergraduate Program Goals, Undergraduate Program Learning Outcomes)
II. Program Assessment Mission & Goals
III. Assessment Methods
IV. Administration of Assessment
V. Conclusions
VI. Appendixes
    - APPENDIX A: Continuous Quality Improvement Plan
    - APPENDIX B: Assessment Implementation Plan
    - APPENDIX C: Curriculum Map
    - APPENDIX D: SLOs Assessment Measures

I. School's and Program's Guiding Principles

School of Construction Management Technology (SCMT) Mission Statement

The mission of the School of Construction Management Technology (SCMT) at Purdue University is to provide academic and educational opportunities designed to advance the profession of construction management. The mission will be accomplished by:

- Providing the educational opportunities that prepare students to become professional constructors/managers of the construction process
- Engaging in scholarly activities that keep the school at the state-of-the-art of application
- Providing service and outreach activities to the construction profession

School of Construction Management Technology (SCMT) Vision Statement

The School of Construction Management Technology (SCMT) at Purdue University will be a preeminent program in applied construction. As a world leader, the School of Construction Management Technology will be recognized for its excellence by:

- Creating and delivering degree programs in applied construction through learning, discovery, and engagement that draw worldwide attention to their outcomes;
- Designing programs for learners of exceptionally high intellectual and creative accomplishments;
- Forging effective interdisciplinary and collaborative partnerships in the university community that create models for such endeavors;
- Partnering with public and private enterprise in the state, nation and abroad as a model for serving common objectives; and
- Recruiting, enhancing, and retaining a world-renowned faculty and staff.

School of Construction Management Technology (SCMT) Strategic Plan (Core Values)

The following are core values held by the faculty and staff of the School of Construction Management Technology:

- Providing exceptional quality technology and management - intensive education that meets the high academic standards of Purdue University as well as the specific needs of the nation's workforce.
- Engaging with the community, business, and industry partners served by the School.
- Taking existing and cutting-edge technologies and applying them to the solution of problems.
- Exploring and discovering new applications of existing and emerging technologies in a scholarly manner.
- Providing students with exceptional quality, unique experiences, and highly interactive (student-to-professor) technology-intensive education.
- Undertaking engagement and development projects that help to grow the economy of Indiana and provide avenues for applied research projects.
- Becoming recognized nationally and internationally as a leading institution in the field of applied construction.
- Integrating real-world problems and solutions within course projects.
- Working with industry to integrate cutting edge technologies into the solution of problems.
- Collaborating with other institutions of higher learning on applied research and educational projects.
- Collaborating with colleagues, both within the Purdue Polytechnic Institute and across the University, as equal partners in ways that capitalize on each other's unique strengths.

• Integrating graduate and undergraduate students within applied research projects.
• Providing students with learning-centered experiences that prepare them to be innovative.
• Actively researching and developing projects with government, business, and industry.
• Providing an educational environment characterized by equal access, inclusiveness, and cultural diversity.
• Proactively updating the school curricula to meet the needs of student, Indiana, and the nation.

School of Construction Management Technology (SCMT) Goals

Five strategic goals have been identified for the School of Construction Management Technology:

• Recruit and retain outstanding faculty and staff to support Construction Management Technology learning, discovery, and engagement.
• Continue to develop effective and relevant undergraduate curricula to prepare graduates for initial and career-long success in areas of industry need that enables learners to acquire core competencies in critical thinking, global communication skills, information literacy, visual information technology, business practices, and research methods.
• Maintain and expand a program to enhance SCMT faculty performance in learning, discovery, and engagement.
• Maintain and expand a program for alumni and SCMT patron fundraising and development.
• Maintain and expand Construction Management Technology Graduate Education.

Undergraduate Construction Management Technology Program Goals

Goal 1. Maintain a high-quality curriculum content and learning environment that will graduate the most sought-after entry-level construction management professionals.

Goal 2. Provide a unique learning environment based on the Polytechnic's 10 Elements of Transformation.

Goal 3. Maintain accreditation of the BS Construction Management Technology by the American Council for Construction Education (ACCE).

Undergraduate Construction Management Technology Program Learning Outcome

The Program has one Learning Outcome: Meet all ACCE Student Learning Outcomes.

II. Program Assessment Mission & Goals

Program Assessment Mission

In order to reach our vision, we are embracing the concept of assessment as a continuous source of information essential for improving student learning outcomes, improving our program, and our teaching and learning methods and strategies. While there are many similar definitions of assessment, Construction Management Technology Program has chosen the following:

"Assessment is an ongoing process aimed at understanding and improving student learning. It involves making our expectations explicit and public; setting appropriate criteria and high standards for learning quality; systematically gathering, analyzing, and interpreting evidence to determine how well performance matches

expectations and standards; and using the resulting information to document, explain, and improve performance. When it is embedded effectively within larger institutional systems, assessment can help us focus our collective attention, examine our assumptions, and create a shared academic culture dedicated to assuring and improving the quality of higher education. '' [1]

Program Assessment Goals

1. To foster a program view of assessment as a necessary response to a demand for accountability with an understanding that assessment is a continuous process and source of information for instructional improvement.
    a. Plan and assess program, course and classroom learning on a continual basis. (See Appendixes A, B, C and D).
    b. Support and foster faculty ownership of the assessment process.
2. To respond to accreditation demands, specifically American Council for Construction Education (ACCE) assessment and accreditation criteria.
3. To facilitate the feedback of assessment results into program, course, and classroom planning.
4. To develop, implement, and improve the assessment process.
    a. Assess and research methods, strategies, and processes for the purpose of ongoing improvement.
    b. Share and collaborate on assessment activities and outcomes both internally and externally.
    c. Oversee assessment plans, instruments, and data collection.

III. Assessment Methods

Assessment Measures

Program outcomes can be assessed using both direct and indirect measures. Direct assessments are tests, Pre/Post Testing, projects, papers/theses, case studies, and portfolios, oral and written exams. Indirect assessments are self-report measures such as surveys (course, program, and university levels). These can include employer, student, and alumni surveys. See Appendix C for some of assessment instruments that will be utilized.

Program-Level Assessment Methods

Some of the methods that can be used for the program-level assessment purposes are:

1. **Capstone courses** - A capstone course, project, or practical experience integrates the knowledge, concepts and skills associated with an entire sequence of study within a discipline or program. The structure and content of a capstone experience is linked to a discipline/program's goals and objectives for student learning. Capstone experiences provide students with a forum to combine various aspects of their program/discipline experiences. Capstone experiences provide faculty and programs/disciplines with a forum to assess student academic achievement in a variety of knowledge and skills-based areas by integrating their educational experiences.
2. **Internship Experience** - Performance in a real-world setting is assessed by employers. Students are assessed in their program/discipline specific job skills, knowledge and in their ability to interact professionally.
3. **Current Students Surveys** - Data gathered by these measures are an indirect assessment of student learning since they measure satisfaction and impressions of educational experiences rather than knowledge and skills

[1] AAHE Bulletin, November, 1995, p.7)

acquired. However, when combined with direct measures of learning, indirect assessments can provide a comprehensive view of means to enhance student academic achievement.

4. **Graduating ("Senior") Students Surveys and Exit Interviews** - these surveys/interviews may assist in understanding the educational needs of our students. Students can provide us with important information about both our curriculum and co-curricular activities. Information can include student insights on educational experiences, what they like or dislike about different instructional approaches, impressions about the classroom environment, program equipment and technology levels, and perceived benefits from student and instructional support services.
5. **Alumni Survey –** a 3-Year survey will be conducted in order to ascertain alumni's feedback of different aspects of the CMT academic program.
6. **Employer surveys** - Employer surveys provide useful information about the curriculum, programs, and students that other forms of assessment cannot provide. Employers provide information about skill levels of recent graduates, abilities to communicate effectively verbally and in writing, specific program competencies, and abilities to utilize current program-specific technology. Employer surveys help us determine the relevance of educational experiences and programs.
7. **Faculty & Adjunct Performance Evaluations** – the key component of any quality program is the strength of the full-time and adjunct faculty. The comprehensive annual performance evaluation of faculty performance, relative to teaching and learning, research and discovery, and engagement and service activities will be utilized.

Classroom Assessment Methods

Classroom assessment methods can be formative or summative. **Formative assessments** are employed during the course of a learning experience, as a source of feedback to improve teaching and learning. Classroom Assessment Techniques (CATs) are formative assessments used to improve teaching and learning. Examples of Classroom Assessment Techniques (CATs), includes: Chapter/ Unit assignments, home works, quizzes, discussion forums, and teacher feedback on work in progress. **Summative Assessments** measure what students have learned at the end of some set of learning activities. An example would be a final comprehensive exam or project given at the end of a course.

The learning process occurs when the planning and design of classroom activities result in desired student outcomes. Student learning activities can include:

- study a text book and other sources of information
- perform course and lab activities
- participate in distributed learning assignments
- demonstrate skills and techniques
- respond to a variety of other-directed activities or assignments.

A faculty member can use Classroom Assessment Techniques (CATs) to gather feedback about a single lecture/discussion, to examine the grasp of key concepts and issues of a topic to assess learner reactions to instructional activities. Feedback from classroom assessment techniques can impact learning in two important ways. First, when a faculty member shares results of the CAT with students, that feedback can assist students in recognizing their strengths and weaknesses with content knowledge. This will help students develop higher-order thinking skills, prepare for future topics, and even help them understand *how* they learn best. Second, the results of the CATs can help faculty identify the student's current understanding of the topic, prepare for upcoming instruction, build upon what students currently know, and fill in knowledge gaps that can keep a student from progressing. CATs are brief and adaptable to a variety of learning environments. CATs can be conducted on a routine basis at the beginning or ending of class, in labs, internships, and in online classes. CATs can assist faculty in enhancing student success and improving academic achievement.

IV. Administration of Assessment

Outcome Assessment Coordinator

The Outcome Assessment Coordinator (a designated full-time faculty or head of the School) is responsible to coordinate the program's quality assessment activities. In addition, he/she will coordinate preparation of the Annual Assessment Report ["Report"]. This Report will serve as the bases for review, discussions and generation of recommendations. The process will incorporate the input from all full-time faculty and staff members.

Responsibility of the Faculty

An important characteristic of an effective assessment program is that it is "faculty-owned and driven." In essence, this means that there must be active and ongoing participation in all phases/stages of assessment. This is important because the curriculum is the under purview of the faculty. Assigning intended outcomes is a faculty responsibility; therefore, assessing the curriculum should be as well. Faculty must also use the results of the assessment data to strengthen and improve the curriculum and to improve student learning. Faculty assessment activities include:

- Conduct classroom assessments in order to focus student learning and implement instructional strategies in support of improving student learning outcomes.
- Participate in planning and conducting program assessments and then collaborate with colleagues to improve program outcomes.

Responsibility of the Students

In order for assessment to work, students must be active participants. Assessment information that directly demonstrates student learning starts with the students themselves. The basic responsibilities of our students are to participate in both the direct assessment activities (tests, products, portfolios, etc.) and indirect assessment activities (interviews, surveys, focus groups, etc.).

Available Resources and Tools

School of Construction Management Technology (SCMT) supports faculty and staff in building assessment knowledge and skills. Assessment is a wide-ranging and dynamic process. Assessment resources can include, for examples, allowing faculty and staff to attend professional development conferences and workshops on assessment, when possible.

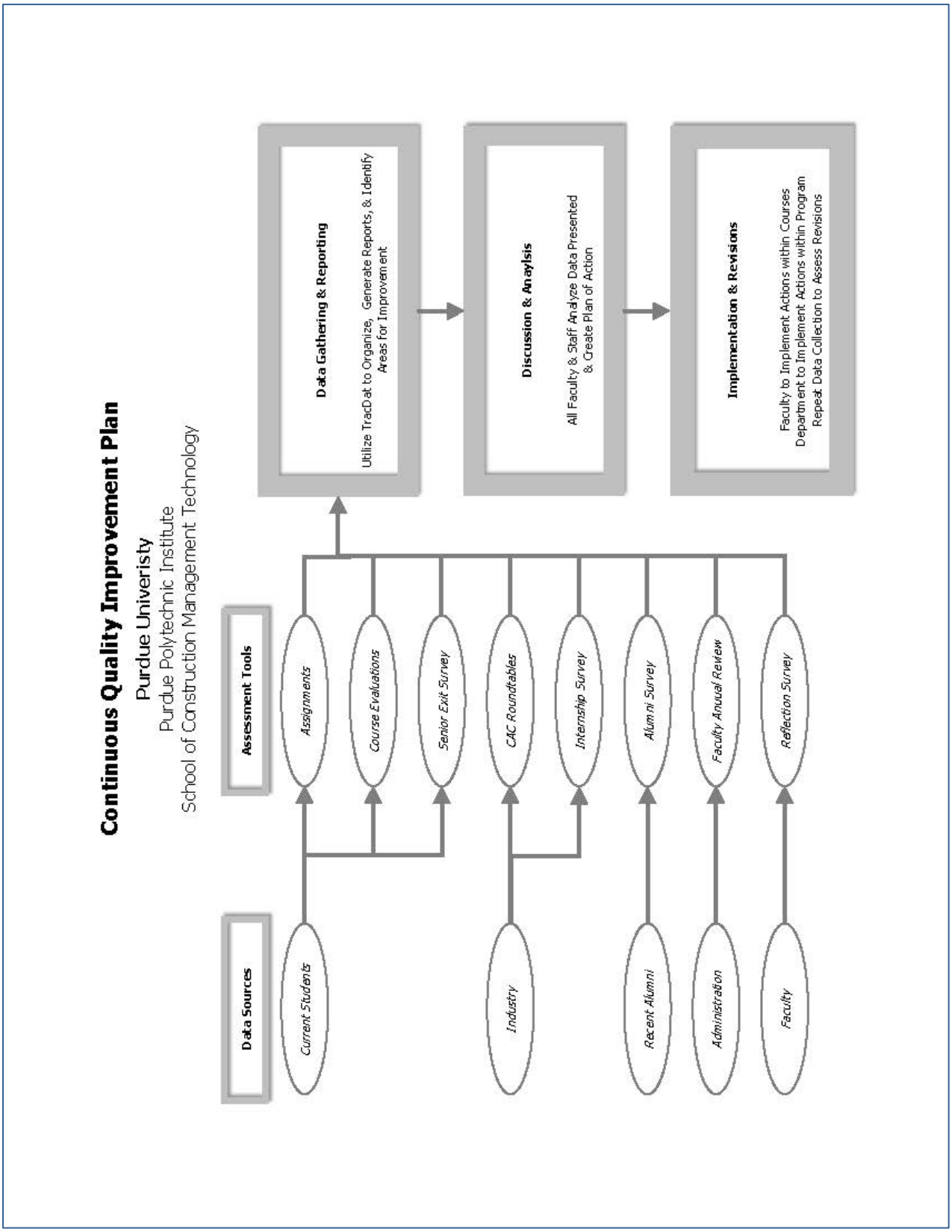
V. Conclusion

Purdue University Construction Management Technology Program's assessment activities are intended to produce an ongoing process of assessment of student academic achievement, reporting results, creating improvements, and evaluating the effects of improvements. The external impetus for outcomes assessment comes from ACCE criteria; the internal impetus is to achieve Construction Management Technology Program's stated purpose, vision, mission, and goals. Improvements in student learning and outcomes increase the likelihood that alumni will reach full potential and be better prepared to contribute to the society at large.

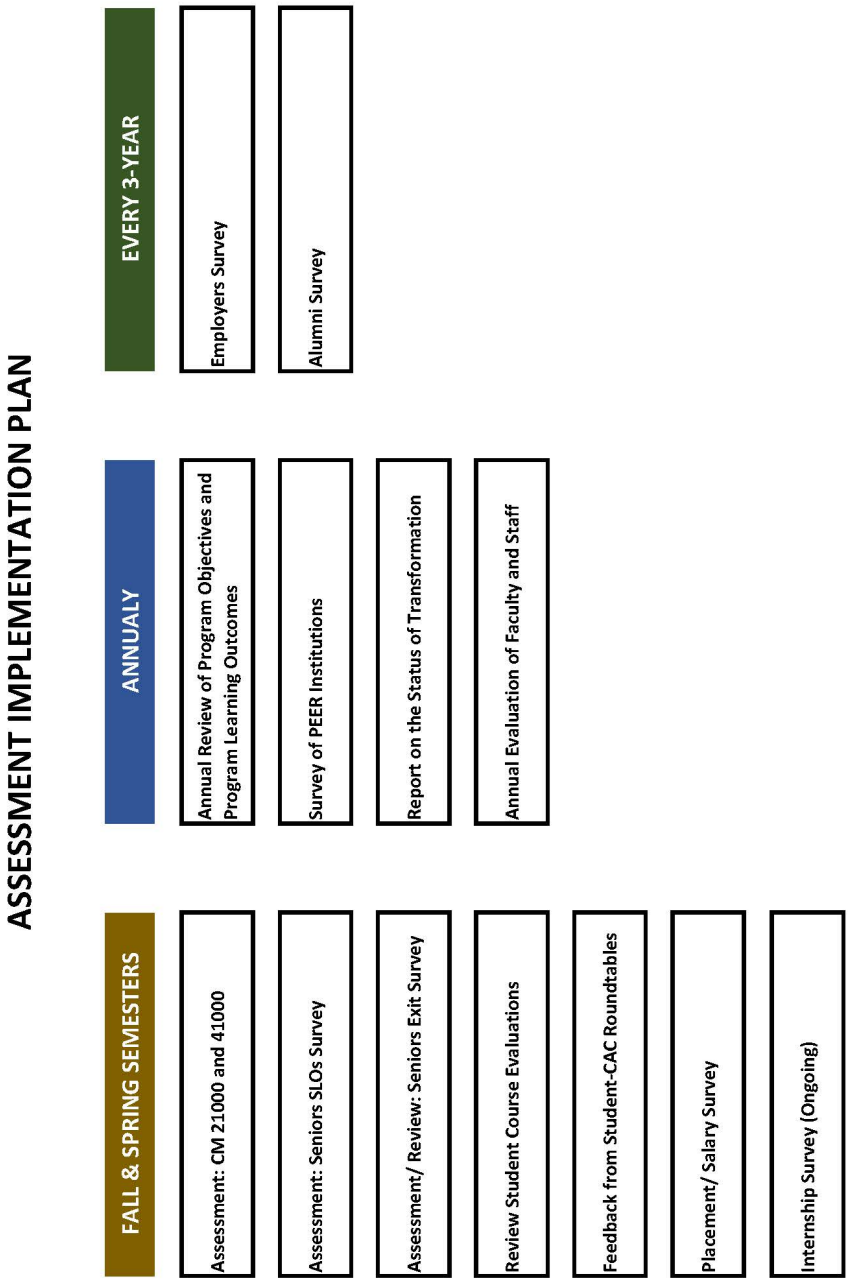
VI. Appendixes

APPENDIX A: Continuous Quality Improvement Plan (QIP)
APPENDIX B: Assessment Implementation Plan
APPENDIX C: Curriculum Map
APPENDIX D: SLOs Assessment Measures

APPENDIX A: Continuous Quality Improvement Plan (QIP)



APPENDIX B: Assessment Implementation Plan



APPENDIX C: Curriculum Map

	Student Learning Outcomes	Required Construction Management Courses												
		CM 10000	CM 11000	CM 15000	CM 20000	CM 21000	CM 25000	CM 30000	CM 35000	CM 39000	CM 40000	CM 41000	CM 45000	CM 49000
1	Create written communications appropriate to the construction discipline	C		C	C	D, I	C	C	C	C	C	D, I	C	C
2	Create oral presentations appropriate to the construction discipline	C		C	C	D, I	C	C	C		C	D, I	C	
3	Create a construction project safety plan		C		C	D, I		C			C	D, I		
4	Create construction project cost estimates	C		C	C	D, I		C			C	D, I		
5	Create construction project schedules	C			C	D, I		C			C	D, I		
6	Analyze professional decisions based on ethical principles					D, I		C		C	C	D, I	C	C
7	Analyze construction documents for planning and management of construction processes	C		C	C	D, I	C	C	C		C	D, I	C	
8	Analyze methods, materials, and equipment used to construct project	C		C		D, I	C		C			D, I		
9	Apply construction management skills as a member of a multi-disciplinary team				C	D, I	C	C	C		C	D, I	C	
10	Apply electronic-based technology to manage the construction process			C	C	D, I	C	C	C		C	D, I	C	
11	Apply basic surveying techniques for construction layout and control			C		D, I	C		C			D, I		
12	Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process	C			C	D, I		C			C	D, I	C	
13	Understand construction risk management	C				D, I	C		C		C	D, I	C	
14	Understand construction accounting and cost control	C			C	D, I	C	C	C		C	D, I	C	
15	Understand construction quality assurance and control	C			C	D, I	C	C	C		C	D, I	C	
16	Understand construction project control processes	C				D, I	C		C			D, I		
17	Understand the legal implications of contract, common, and regulatory law to manage a construction project					D, I					C	D, I	C	
18	Understand the basic principles of sustainable construction	C			C	D, I	C					D, I		
19	Understand the basic principles of structural behavior				C	D, I		C				D, I		
20	Understand the basic principles of mechanical, electrical and piping systems			C		D, I	C		C			D, I		

D: SLO Assessed for ACCE data collection (Direct Assessment)
I: SLO Assessed for ACCE data collection (Indirect Assessment)
C: SLO Content Covered in Course

APPENDIX D: SLOs Assessment Measures

School of Construction Management Technology Assessment Measures

		CM 21000		CM4 41000	
	Student Learning Outcomes	Direct Assessment	Indirect Assessment	Direct Assessment	Indirect Assessment
1	Create written communications appropriate to the construction discipline	Write a Site Specific Safety Plan	Student Self-Evaluation Survey	Write a Site Specific Safety Plan	Student Self-Evaluation Survey
2	Create oral presentations appropriate to the construction discipline	Present of a portion of a Project Schedule	Student Self-Evaluation Survey	Present of a portion of a Project Schedule	Student Self-Evaluation Survey
3	Create a construction project safety plan	Write a Site Specific Safety Plan	Student Self-Evaluation Survey	Write a Site Specific Safety Plan	Student Self-Evaluation Survey
4	Create construction project cost estimates	Create a portion of a Project Cost Estimate	Student Self-Evaluation Survey	Create a portion of a Project Cost Estimate	Student Self-Evaluation Survey
5	Create construction project schedules	Create a portion of a Project Schedule	Student Self-Evaluation Survey	Create a portion of a Project Schedule	Student Self-Evaluation Survey
6	Analyze professional decisions based on ethical principles	Write a response to an Ethical Case Study	Student Self-Evaluation Survey	Write a response to an Ethical Case Study	Student Self-Evaluation Survey
7	Analyze construction documents for planning and management of construction processes	Write an analysis of a Job Site Layout Plan	Student Self-Evaluation Survey	Write an analysis of a Job Site Layout Plan	Student Self-Evaluation Survey
8	Analyze methods, materials, and equipment used to construct project	Calculate difference in crew cost and productivity, write a response	Student Self-Evaluation Survey	Calculate difference in crew cost and productivity, write a response	Student Self-Evaluation Survey
9	Apply construction management skills as a member of a multi-disciplinary team	Role play within a mock meeting given an issue with a Project	Student Self-Evaluation Survey	Role play within a mock meeting given an issue with a Project	Student Self-Evaluation Survey
10	Apply electronic-based technology to manage the construction process	Use of Excel or ASTA to create a portion of a Project Schedule	Student Self-Evaluation Survey	Use of Excel or ASTA to create a portion of a Project Schedule	Student Self-Evaluation Survey
11	Apply basic surveying techniques for construction layout and control	Coordinate Layout Calculations	Student Self-Evaluation Survey	Coordinate Layout Calculations	Student Self-Evaluation Survey
12	Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process	Multiple Choice Quiz	Student Self-Evaluation Survey	Multiple Choice Quiz	Student Self-Evaluation Survey
13	Understand construction risk management	Multiple Choice Quiz	Student Self-Evaluation Survey	Multiple Choice Quiz	Student Self-Evaluation Survey
14	Understand construction accounting and cost control	Multiple Choice Quiz	Student Self-Evaluation Survey	Multiple Choice Quiz	Student Self-Evaluation Survey
15	Understand construction quality assurance and control	Multiple Choice Quiz	Student Self-Evaluation Survey	Multiple Choice Quiz	Student Self-Evaluation Survey
16	Understand construction project control processes	Multiple Choice Quiz	Student Self-Evaluation Survey	Multiple Choice Quiz	Student Self-Evaluation Survey
17	Understand the legal implications of contract, common, and regulatory law to manage a construction project	Multiple Choice Quiz	Student Self-Evaluation Survey	Multiple Choice Quiz	Student Self-Evaluation Survey
18	Understand the basic principles of sustainable construction	Multiple Choice Quiz	Student Self-Evaluation Survey	Multiple Choice Quiz	Student Self-Evaluation Survey
19	Understand the basic principles of structural behavior	Multiple Choice Quiz	Student Self-Evaluation Survey	Multiple Choice Quiz	Student Self-Evaluation Survey
20	Understand the basic principles of mechanical, electrical and piping systems	Multiple Choice Quiz	Student Self-Evaluation Survey	Multiple Choice Quiz	Student Self-Evaluation Survey

*Note: The same type of direct assessments will be used for both CM 21000 and CM 41000; however, they will not be the exact same assignment nor the same projects used for each course level