Appendix C

CM Program Assessment Plan

Section
4

Assessment Plan for the Construction Management Program

Introduction

The Construction Management Program focuses on providing the student both the “soft” collaborative skills and the “hard” technical skills to prepare the graduate to lead and manage a construction project. The construction graduate will work closely with owners, architects, engineers, and trade contractors throughout the entire design-build process. Graduates will typically take responsibility for the budgeting, scheduling and control of the construction operation. Construction careers are broadly diversified with our graduates finding employment in the principle industry sectors to include: residential, commercial building, heavy highway and industrial. Every construction management graduate also earns a Business minor.

The construction management program is designed to encompass six functional categories of courses:

- General Education
- Mathematics and Science
- Business and Management
- Construction Science
- Construction
- Other program specific courses

Each of these categories provides the student with an essential component of their overall educational experience and ensures that students are prepared for construction management practice as required by our accrediting body.

Curricular Functional Design

As discussed above, the construction management curriculum is designed around six functional categories of courses. Each of these functional categories is discussed below.

1. General Education

It is important that every Constructor's education include appropriate courses in communications, social sciences, and the humanities. This content should reflect the needs of the construction industry as well as the philosophy of the educational institution. Construction is concerned with people and their relationships. Thus, the ability to communicate, both orally and in writing, and the understanding of human behavior are essential assets to the constructor.

Table 4.1 General Education Courses

Course Number	Course Title	Credits
COMM 210	Intro to Speech Communications	3
CORE 102	History and the Modern World	3
CORE 103	Human Behavior	3
CORE 104	Lit Phil & Ascent of Ideas	3
CORE 105	Artistic Impulse	3
WTNG 102	Expository Writing	3
WTNG 220	Critical Writing for the Professions	3
Total Credits		**21**

2. Mathematics and Science

It is essential that every Constructor possess a well-developed concept of mathematics and physical science. Construction is in part a technical process that can be best controlled by applying the principles of mathematics, statistics, and computer science. Furthermore, an understanding of the behavior of the materials, equipment, and methods used in construction requires knowledge of the laws of physics, chemistry, geology, and environmental sciences. Basic scientific, quantitative, and qualitative topics, which provide a foundation for subsequent technical subjects, are to be considered in this category.

Table 4.2 Mathematics and Science Courses

Course Number	Course Title	Credits
MATH 124	Basic Statistics	3
MATH 136	Precalculus	4
MATH 207	Applied Calculus	3
PHYS 201	Physics I and Lab	4
CHEM 191	Chemistry I and Lab	4
Total Credits		**18**

3. Business and Management

The Constructor is a manager. To be an effective manager, the Constructor must know how to manage the principal resources of the industry, i.e., people and money. The

Constructor should have a broad understanding of the fundamentals of the free enterprise system, accounting, finance, business regulations, contract law, labor law, and marketing. This category involves fundamental courses to provide a foundation for contemporary business practices appropriate to applications in construction. No specific number of semester hours or subject areas are required, however, eighteen semester hours are required in this category.

Table 4.3 Business and Management

Course Number	Course Title	Credits
ACCTG 101	Accounting I: Financial	3
ECON 102	Principles of Microeconomics	3
MGMT 200	Management Principles	3
MRKT 200	Marketing Principles	3
LS 220 or BUSN 305	Legal Elective	3
	Business Elective	3
Minimum Total Credits		**18**

4. Construction Science

The Constructor must have an understanding of the contribution of the design disciplines' processes. The Constructor must be able to communicate with the design professionals and should be capable of participating during the planning phase of design-build projects. Construction sciences and architectural or engineering design topics selected to facilitate communications with the design disciplines and to solve practical construction problems are included in this category.

Table 4.4 Construction Science

Course Number	Course Title	Credits
CNST 116	Computer Applications in Construction	3
CNST 130	Plans, Specifications and Building Codes	3
CNST 200	Construction Methods and Materials and Lab 1	4
CNST 201	Construction Methods and Materials and Lab 2	4
CNST 250	Construction Equipment	3
CNST 302	Surveying and Lab	4
CNST 304	Applied Structures	3
CNST 455	Mechanical and Electrical Design for Buildings	3
ENGR 210	Engineering Mechanics I	3
Total Credits		**30**

5. Construction

The construction curriculum category is of vital importance in a quality construction curriculum. Courses should include both office and field activities and include the effective management of personnel, materials, equipment, costs, and time. All types of construction should be included. Curricula topics should address the constructor's role as a member of a multi-disciplinary team, the assessment of project risk, and the alternate methods that can be used to structure the owner-designer-constructor team. Course work will examine the various roles and responsibilities of project participants throughout a project's life and the creative ways that project teams can be assembled. Fundamental topics to provide an appropriate combination of breadth and depth in current construction industry practice are to be considered in this category. These topics should develop skills that will facilitate advancement of the individual in the construction profession. Construction courses should be presented in a manner that encourages problem definition and solution, creativity,

communication, evaluation, and continuous learning. The knowledge, understanding, and skills gained from prerequisite courses should be integrated and utilized in subsequent courses.

Table 4.5 Construction

Course Number	Course Title	Credits
CNST 100	Introduction to Construction Management	3
CNST 116	Computer Applications in Construction	3
CNST 260	Construction Estimating and Scheduling	3
CNST 321	Advanced Building Estimating	3
CNST 450	Construction Planning and Scheduling	3
CNST 455	Construction Project Management and Lab	4
CNST 475	Construction Project Control	3
CNST 480	Construction Management Capstone	3
CNST XXX	Construction Elective	3
Total Credits		**28**

6. Other Program Requirements

The Roger Williams University Core Concentration involves the a five-course exploration of one liberal arts discipline unrelated to the major. Construction management students select their core concentration from 39 different fields of study. This requirement ensures that students graduate with significant knowledge of at least two fields; that of the major and that of the core concentration.

Table 4.6 Other Program Requirements

Course Number	Course Title	Credits
	Core Concentration	15
Total Credits		**15**

Construction Management Program Mission and Objectives

The CM program's mission is to "*advance the body of construction knowledge through instruction, research and service, and through resourceful graduates who possess the moral foundation and technical skills to lead the profession*."

Table 4.7 lists RWU CM program objectives that are developed by program constituencies in an effort to accomplish the program's mission. These objectives were most recently updated in 2015 and will be published in the Roger Williams University Undergraduate Catalog in 2017, on the School of Engineering, Computing and Construction Management's and the CM program's web sites as well as in a number of CM promotional materials. All incoming freshmen receive bookmarks listing the Construction Management Program's objectives and outcomes.

Table 4.7 RWU Construction Management Program Educational Objectives

CM Program Objectives
FACULTY AND STAFF: Recruit and retain exceptional and diverse faculty and staff to support program, school, and university objectives.
EDUCATIONAL: Three to five years after graduation, we expect that our graduates: ▪ Demonstrate exemplary cutting edge technical knowledge and skills. ▪ Value the concept of life-long learning and continue to grow intellectually while keeping informed of new concepts and developments in the construction process. ▪ Are recognized as regional, national, and international construction industry leaders. ▪ Always display the highest standards of ethical conduct.
SERVICE: Advance the construction management profession by becoming actively involved in professional associations and societies, serving in professional and community volunteer positions, and acting as a role model for future generations of constructors.
ALUMNI: Grow and maintain an engaged network of alumni to support and advance program mission and goals.
STUDENTS: Recruit and retain a committed, qualified, passionate and diverse body of students.
CULTURE: Embrace a culture of professionalism, innovation, collaboration, and tolerance.
BRANDING: Maintain a reputation within the local, national and international communities as a leading academic provider of construction education.
FACILITIES & RESOURCES: Maintain convenient, well equipped, and state-of-the-art facilities and resources to support learning and research.

The university embarked on a year-long effort to redefine its vision and goals. The RWU Vision Project resulted in five Core Values which were adapted by the Board of Trustees, effect fall 2015. These Core Values are defined as follows:

- *Transformative*: We are committed to an expansive student-centered experience, characterized by academic rigor, critical thinking, collaboration and community engagement that enriches students, the University and the broader society.
- *Engaged*: We collaborate with one another and with constituencies outside the University to promote individual learning and to help address community needs.
- *Experiential*: We provide an educational environment that bridges theory and practice, enhancing the ability of students to fulfill their potential and to contribute to society.
- *Inclusive*: We welcome and value all expressions of diversity and identity, actively promote inclusion and prepare students to challenge societal norms and to thrive in a culturally divers and global society.
- *Innovative*: We are nimble in developing and piloting changes for the continuous improvement of learning, service and all other aspects of University life.

The Construction Management Program Objectives are consistent with the goals of the University. Table 4.8, Alignment and Mapping of RWU Values and Construction Management Program Objectives, shows the alignment and mapping between the University Core Values, and the Construction Management Program Objectives.

Table 4.8 Alignment and Mapping of the Construction Management Program Objectives to the RWU Core Values

W = Weak Relationship M = Moderate Relationship S = Strong Relationship

RWU Core Values, and CM Program Objectives		CM Program Objectives										
		1	2	3	4	5	6	7	8	9	10	11
RWU Core Values	Transformative	S	M	S	S	S	S	W	M	M	S	S
	Engaged	W	S	M	S	S	S	S	S	S	S	S
	Experiential	M	S	S	S	S	S	M	W	M	W	S
	Inclusive	S	W	M	S	S	S	M	S	S	W	W
	Innovative	S	S	S	M	W	M	W	M	S	M	S

Construction Management Program Outcomes

Construction Management program outcomes correspond to the knowledge, skills and behavior that are we expect our construction graduates to possess at the time of their graduation. These outcomes are established and periodically updated based on constituency input. In 2015, the CM program adopted American Council for Construction Education (ACCE) Student Learning Outcomes (SLO) as the Program Learning Outcomes (PLO). The outcomes for construction management program that we expect our graduates to possess at graduation are:

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

These program outcomes are related to the construction management program educational objectives as presented in Table 4.9, Construction Management Educational Objectives linked to Construction Management Program Outcomes.

Table 4.9 Construction Management Program Educational Objectives linked to Program Outcomes

W = Weak Relationship M = Moderate Relationship S = Strong Relationship

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

Curriculum Matrices

The following two tables, Tables 4.10.a and 4.10.b, map the CM curriculum to ACCE-mandated student learning outcomes and the CM program learning outcomes.

Table 4.10.a Mapping of construction core courses to ACCE SLOs / CM PLOs #1 - #10

Instructor managing the documentation	Semester Taught - FALL (F) or SPRING (S)	Course No	**OUTCOME #1** - Create written communications appropriate to the construction discipline.	**OUTCOME #2** - Create oral presentations appropriate to the construction discipline.	**OUTCOME #3** - Create a construction project safety plan	**OUTCOME #4** - Create construction project cost estimates.	**OUTCOME #5** - Create construction project schedules.	**OUTCOME #6** - Analyze professional decisions based on ethical principles.	**OUTCOME #7** - Analyze construction documents for planning and management of construction processes.	**OUTCOME #8** - Analyze methods, materials, and equipment used to construct projects.	**OUTCOME #9** - Apply construction management skills as a member of a multi-disciplinary team.	**OUTCOME #10** - Apply electronic-based technology to manage the construction process.
Ghatee	F	**CNST100**	I	I		I	I	I	I		I	
Brunnhoeffer	F	**CNST116**	I	I	I	I	I		I			I
Brunnhoeffer	S	**CNST130**	I		I	I	I		I	I	I	I
Emmer	S	**CNST200**							R	R		
Emmer	F	**CNST201**	R						R	R		
Ghanem	S	**CNST250**			R	R				R		
Gould	F	**CNST260**				R	R		R		R	R
Al-Hamdouni	F	**CNST302**										
Ghanem	F	**CNST321**	R	R		MA		R	R			R
Baldwin	F	**ENGR 210**								R		
Ghanem	S	**CNST304**										
Celik	S	**CNST450**					MA		M	R		R
Gould	F	**CNST445**	M	M	R			R			MA	
Celik	F	**CNST475**					R	R				R
Emmer	S	**CNST455**	M			R	R		M	M		R
Brunnhoeffer	S	**CNST480**	MA	MA	MA	MA	MA	MA	MA	MA		MA

Table 4.10.b Mapping of construction core courses to ACCE SLOs / CM PLOs #11 - #20

Instructor managing the documentation	Semester Taught - FALL (F) or SPRING (S)	Course No	**OUTCOME #11** - Apply basic surveying techniques for construction layout and control.	**OUTCOME #12** - Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.	**OUTCOME #13** - Understand construction risk management.	**OUTCOME #14** - Understand construction accounting and cost control.	**OUTCOME #15** - Understand construction quality assurance and control	**OUTCOME #16** - Understand construction project control processes.	**OUTCOME #17** - Understand the legal implications of contract, common, and regulatory law to manage a construction project.	**OUTCOME #18** - Understand the basic principles of sustainable construction.	**OUTCOME #19** - Understand the basic principles of structural behavior.	**OUTCOME #20** - Understand the basic principles of mechanical, electrical and piping systems.
Ghatee	F	**CNST100**		I	I				I	I		
Brunnhoeffer	F	**CNST116**	I			I		I				
Brunnhoeffer	S	**CNST130**	R	I	I	I	I		I		I	I
Emmer	S	**CNST200**					I		R	I		R
Emmer	F	**CNST201**					I			I	I	
Ghanem	S	**CNST250**				I						
Gould	F	**CNST260**		R						R		
Al-Hamdouni	F	**CNST302**	MA									
Ghanem	F	**CNST321**			R							R
Baldwin	F	**ENGR 210**									R	
Ghanem	S	**CNST304**									MA	
Celik	S	**CNST450**						R				
Gould	F	**CNST445**		MA	R	R	R	R	MA	MA		
Celik	F	**CNST475**			R	MA	R	MA				
Emmer	S	**CNST455**								M		MA
Brunnhoeffer	S	**CNST480**			MA		MA					

Notes for Tables 4.10.A and 4.10.B: ***Introduce (I):*** *Students are introduced to the outcome. In this case, the course includes some elements that contribute to the achievement of this outcome, but this learning outcome is not a major focus for the course.* ***Reinforce (R):*** *Outcome is reinforced and students afforded opportunities to practice. Several course learning outcomes support the achievement of this outcome but the integration of relevant knowledge, skills, and abilities necessary for mastery of the outcome does not occur in this course.* ***Mastery (M):*** *Students have had sufficient practice and can now accomplish the outcomes at the level the outcome states. The syllabus indicates at least one course learning outcome that entails an integration of the knowledge, skills, and abilities necessary for mastery of the outcome.* ***Mastery/Direct Assessment (MA):*** *This course satisfies the conditions listed for Mastery and has a direct assessment that the program uses to assess the associated outcome.*

Metric Goals for Each 1 - 11 Construction Management Program Objectives

After reviewing all program objectives through processes that includes all program constituencies, the CM program defines metrics associated with each objective. These metrics, targets and assessment tools are updated as necessary during the "CM Assessment Meeting" held annually at the end of the spring semester. The tables in this section show the metrics associated with each objective and where the metric is measured as well as the targets for each metric. After completing the various assessment instruments, the determination of whether the outcome has been successfully achieved is evaluated by the program faculty. All metrics associated with all eleven (11) objectives are measured annually and the assessment of all eleven (11) objectives is completed at the end of the spring semester. A CM program assessment report including the results of the program objective assessment are shared with the dean and the program faculty. Reports from the most recent three years are published and updated on the CM program website.

Table 4.11 CM Program Objective #1, Metrics and Targets

FACULTY & STAFF	
Objective #1: Recruit and retain exceptional and diverse faculty and staff to support program, school, and university objectives.	
Metrics Associated with Objective	**Where Measured**
At least 80% of graduating seniors report to be satisfied or very satisfied with the helpfulness of CM staff.	Senior Exit Survey
At least 80% of graduating seniors report to be satisfied or very satisfied with the helpfulness of CM faculty.	Senior Exit Survey
CM faculty and staff demographics are comparable to ACCE accredited peer institutions in ASC's Region 1.	Diversity Stats – Peers 85% M; 15% F 3%B; 3%A; 3%H
At least one academic conference attendance or presentation or journal paper published by 80% of full time tenured or tenure track faculty. At least one academic conference presentation or journal paper published by 80% of full time tenured or tenure track faculty.	Faculty Survey
At least one academic conference presentation or publication co-authored by at least one full-time CM faculty and an undergraduate CM student.	CM Research Group Report
50% of full time faculty conducted at least one consulting activity for the construction industry OR research with industry support OR faculty internship.	Faculty Survey

Table 4.12 CM Program Objective #2, Metrics and Targets

EDUCATIONAL Three to five years after graduation, we expect that our graduates to:	
Objective #2: Demonstrate exemplary cutting edge technical knowledge and skills.	
Metrics Associated with Objective	**Where Measured**
At least 80% of graduating seniors answer the following question as satisfied or very satisfied: CM Program increased my technical knowledge and skills.	Senior Exit Survey
At least 80% of alumni (5 years out) answer the following question as satisfied or very satisfied: The RWU CM Program helped me to demonstrate exemplary cutting edge technical knowledge and skills.	Alumni Survey
CM Program Learning Outcome (PLO) assessment indicates 100% of PLOs to be satisfactory OR lists specific action plans to address any PLOs that are indicated as weaknesses.	PLO Assessment
At least 80% of the employers report interns': - Technical Knowledge as outstanding or In tune - Estimating skills as very or moderately knowledgeable - Scheduling skills as very or moderately knowledgeable - CAD skills as extremely or moderately proficient - Excel skills as extremely or moderately proficient	Employer Internship Survey

Table 4.13 CM Program Objective #3, Metrics and Targets

EDUCATIONAL Three to five years after graduation, we expect that our graduates:	
Objective #3Value the concept of life-long learning and continue to grow intellectually while keeping informed of new concepts and developments in the construction process.	
Metrics Associated with Objective	**Where Measured**
At least 80% of graduating seniors answer the following question as agree or strongly agree: The CM Program has got me interested in lifelong learning or continuing education.	Senior Exit Survey
At least 80% of alumni (5 years out) answer the following question as agree or strongly agree: The RWU CM Program helped me recognize the value the concept of life-long learning and continue to grow intellectually while keeping informed of new concepts and developments in the construction process.	Alumni Survey
At least 50% of CM seniors sit in for the AC Level I exam.	AC Exam Attendance
At least 20% of alumni (5 years out) report to have received a graduate degree or a certificate.	Alumni Survey

Table 4.14 CM Program Objective #4, Metrics and Targets

EDUCATIONAL Three to five years after graduation, we expect that our graduates:	
Objective #4: Graduate students who are recognized as regional, national, and international construction industry leaders.	
Metrics Associated with Objective	**Where Measured**
At least 80% of graduating seniors answer the following question as agree or strongly agree: CM Program has increased my enthusiasm to become a leader in the construction industry.	Senior Exit Survey
At least 80% of alumni (5 years out) answer the following question as agree or strongly agree: The RWU CM Program helped me obtain the skills necessary to become a regional, national, and international construction industry leader.	Alumni Survey
At least 5% of all RWU alumni with a profile on Linkedin is holding an executive or higher position in the construction industry.	LinkedIn Data
At least 1% of all RWU alumni with a profile on Linkedin has worked or is working in a construction related area outside of the US.	LinkedIn Data
At least one RWU CM alum was nominated as the current academic year's CMPAB Distinguished Person of the Year Award.	CM Coordinator

Table 4.15 CM Program Objective #5, Metrics and Targets

EDUCATIONAL Three to five years after graduation, we expect that our graduates:	
Objective #5: Graduate students who always display the highest standards of ethical conduct.	
Metrics Associated with Objective	**Where Measured**
At least 80% of graduating seniors answer the assessment question for PLO #6 (Ethical Principles) as agree or strongly agree.	Senior Exit Survey
At least 80% of alumni (5 years out) answer the following question as agree or strongly agree: The RWU CM Program helped me to always display the highest standards of ethical conduct.	Alumni Survey
At least 80% of alumni (5 years out) answer the following question as agree or strongly agree: It is as important to be ethical as it is to follow the law.	Alumni Survey
CM Program Learning Outcome (PLO) assessment indicates PLO #6 to be satisfactory OR lists specific action plans to address any PLOs that are indicated as weaknesses.	PLO Assessment
Capstone course assessment report indicates that the direct assessment of its ethics CLO is equal to or higher than 80%.	Capstone Ethics Outcome

Table 4.16 CM Program Objective #6, Metrics and Targets

SERVICE	
Objective #6: Advance the construction management profession by becoming actively involved in professional associations and societies, serving in professional and community volunteer positions, and acting as a role model for future generations of constructors.	
Metrics Associated with Objective	**Where Measured**
At least 80% of graduating seniors answer the following question as agree or strongly agree: The CM Program has motivated me to join a relevant professional society.	Senior Exit Survey
At least 80% of graduating seniors answer the following question as "YES": Are you actively involved in professional associations or societies or serving in professional or community volunteer positions?	Alumni Survey (5 yr out)
At least 5% of all CM alumni with a profile on LinkedIn to list "skilled volunteering" or "board service" as an interest.	LinkedIn Data
100% of full time CM faculty are active members of at least one construction related professional association.	Faculty Survey
100% of CM students received Feinstein Service Learning credit prior to graduation.	Transcripts
At least one CM student group was involved with construction related community service.	Student Club Reports

Table 4.17 CM Program Objective #7, Metrics and Targets

STUDENTS	
Objective #7: Recruit and retain a committed, qualified, passionate and diverse body of students.	
Metrics Associated with Objective	**Where Measured**
At least 80% of graduating seniors answer the following question as good or very good: Please rate the quality of the CM student body. At least 80% report good or very good.	Senior Exit Survey
Diversity statistics of CM students are comparable to RWU or RI race/ethnic/gender data.	Registrar / Institutional Research
Maintain a minimum of 90% retention rate for the 6-yr graduation rate.	Registrar / Institutional Research
At least 10% of all graduating CM students participated in student competitions.	Senior Exit Survey
Average GPA of all CM students who started at RWU in the fall semester and were still enrolled by Spring 2016 is at least 2.75.	Transcripts
At least 80% of all CM freshmen declare construction management major as their first choice of major.	Freshmen Survey

Table 4.18 CM Program Objective #8, Metrics and Targets

ALUMNI	
Objective #8: Grow and maintain an engaged network of alumni to support and advance program mission and objectives.	
Metrics Associated with Objective	**Where Measured**
At least 80% of graduating seniors answer the following question as agree or strongly agree: I am planning to support and advance RWU CM program mission and objectives by staying involved after graduation.	Senior Exit Survey
At least 80% of graduating seniors answer the following question as "YES": Have you had any direct engagement with the RWU CM program since graduation?	Alumni Survey
At least 50% of the Program Learning Outcome Mentors (PLOM) are graduates of the RWU CM program.	PLOM List
At least 30% of the CM Professional Advisory Board (CMPAB) to be the graduates of the RWU CM program.	CMPAB List
The number of CM Annual Alumni Banquet attendees exceed 80% of the number of students registered in the CM program as of the preceding Fall semester.	RWU Advancement Data
At least 80% of graduating seniors answer the following question as agree or strongly agree: I am planning to support and advance RWU CM program mission and objectives by staying involved after graduation.	RWU Advancement Data

Table 4.19 CM Program Objective #9, Metrics and Targets

CULTURE	
Objective #9: Embrace a culture of professionalism, innovation, collaboration, and tolerance.	
Metrics Associated with Objective	**Where Measured**
At least 20% of graduating seniors answer the following question as "YES": Did you participate in a short or long term study abroad program or any other academic activities abroad during your education at RWU?	Senior Exit Survey
At least 80% of graduating seniors answer the following question as agree or strongly agree: RWU CM community encourages and welcomes individuals with different opinions.	Senior Exit Survey
At least 80% of alumni (5 years out) answer the following question as agree or strongly agree: The RWU CM community encouraged and welcomed individuals with different opinions.	Alumni Survey
At least 80% of employers report their interns: - as completely dependable or dependable above average - quite poised and confident or has appropriate self-assurance - always on time - exceptionally well-accepted or works well with others.	Employer Internship Survey
At least 5% of all CM students participated in faculty led student research outside of class prior to graduation.	CM Research Group Report & Faculty Survey
CM club arranged at least 4 guest speakers/workshops AND the attendance at these events included at least 25% of all CM students.	CM Club Report

Table 4.20 CM Program Objective #10, Metrics and Targets

BRANDING	
Objective #10: Maintain a reputation within the local, national and international communities as a leading academic provider of construction education.	
Metrics Associated with Objective	**Where Measured**
At least 80% of graduating seniors answer the following question as likely or very likely.	Senior Exit Survey
At least 80% of alumni (5 years out) answer the following question as agree or strongly agree: I believe the RWU CM program is a leading academic provider of construction education.	Alumni Survey
Social media account followers increased by 50% compared to the previous AY.	Social Media Data
At least 80% of all CM freshmen report RWU as their first choice.	Freshmen survey
All student teams competing in competitions placed in top 3.	CM Club Report
At least 2 faculty (or faculty led students) to present CM related work at peer reviewed international conferences.	CM Club Report

Table 4.21 CM Program Objective #11, Metrics and Targets

FACILITIES	
Objective #11: Maintain convenient, well equipped, and state-of-the-art facilities and resources to support learning and research.	
Metrics Associated with Objective	**Where Measured**
At least 80% of alumni (5 years out) answer the following question as satisfied or very satisfied: Please rate the quality of overall SECCM classrooms and labs.	Senior Exit Survey
At least 80% of alumni (5 years out) answer the following question as satisfied or very satisfied: Please rate the quality of the SECCM "rCloud".	Senior Exit Survey
100% of CM faculty report to be satisfied or very satisfied with the facilities.	Faculty Survey
No CNST laboratory section exceeds 16 students AND No CNST lecture exceeds 36 students AND no CNST course with a computer software related outcome exceeds 24 students.	Registrar

Metric Goals for Each 1 - 20 Construction Management Program Outcome

After reviewing operationalized learning objectives for each outcome, construction management constituencies review and refine metrics associated with each outcome. These metrics, targets and assessment tools are updated as necessary during the "CM Assessment Meeting" held annually at the end of the spring semester. The tables in this section show the metrics associated with each outcome and where the metric is measured as well as the targets for each metric. It is important to note that the CM program assessment plan requires at least one direct and one indirect assessment tool to assess all PLOs annually. Direct assessment tools are based on actual student work, including reports, exams, assignments, demonstrations, performances or other work that require reviewers to assess the level at which students meet course and program expectations. Direct assessment tools are indicated with "(D)" on the PLO tables in this section. After completing the various assessment instruments, the determination of whether the outcome has been successfully achieved is evaluated by the program faculty. All metrics associated with all twenty (20) outcomes are measured annually and the assessment of all twenty (20) outcomes is completed at the end of the spring semester. Results are shared with the dean and the program faculty and the associated reports from the most recent three years are published and updated on the CM program website.

Table 4.22 SLO/PLO #1 - Metrics, Targets, and Assessment Tools

Outcome 1: Create written communications appropriate to the construction discipline.	
Metrics Associated with Outcome	**Where Measured**
1. 100% of CM students successfully complete at least two writing courses.	Transcript
2. 100% graduating seniors report that they are proficient in creating written communications appropriate to the construction discipline. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency achieved and 1 means proficiency not achieved.*	Student Exit Survey
3. At least 50% of all CM courses require "creating written communications appropriate to the construction discipline".	Course Syllabi
4. CNST 480 – Capstone Project, Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	Capstone Syllabus Capstone Final Project Rubric & CLO Grades (D)
5. 100% of employers who take a survey will report CM rising senior interns' writing communication to be either "Concise, factual, effective" or "Outstanding"	CM Intern Employer Survey

Table 4.23 *SLO/PLO #2 - Metrics, Targets, and Assessment Tools*

Outcome 2: Create oral presentations appropriate to the construction discipline.	
Metrics Associated with Outcome	**Where Measured**
1. 100% of employers who respond to the Internship Survey will report CM rising senior interns to be either “Clearly communicating ideas” or “Very articulate”.	CM Intern Employer Survey
2. 100% of seniors will have the opportunity in construction classes to make an oral presentation at least twice a semester during their senior year.	CARs
3. 100% of all freshmen, sophomore and juniors will have the opportunity to make an oral presentation in a construction class at least 1 time a year.	CARs
4. CNST 480 – Capstone Project, Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	Capstone Syllabus Capstone Final Project Rubric & CLO Grades (D)
5. 100% of graduating seniors report that their RWU education has prepared them proficiently in communication skills for the workplace. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency achieved and 1 means proficiency not achieved.*	Student Exit Survey

Table 4.24 SLO/PLO #3 - Metrics, Targets, and Assessment Tools

Outcome 3: Create a construction project safety plan.	
Metrics Associated with Outcome	**Where Measured**
1. Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	Capstone Syllabus Capstone Final Project Rubric & CLO Grades (D)
2. At least 30% of all construction courses will include a construction project safety related CLO and will assess the CLO in their course assessment reports with at least one direct and one indirect measure.	Course Syllabi CARs
3. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.*	Student Exit Survey

Table 4.25 SLO/PLO #4 - Metrics, Targets, and Assessment Tools

Outcome 4: Create construction project cost estimates.	
Metrics Associated with Outcome	**Where Measured**
1. CNST 480 – Capstone Project, Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	Capstone Syllabus Capstone Final Project Rubric & CLO Grades (D)
2. CNST 321 – Advanced Building Estimating will adopt this outcome into its CLOs and report the overall average of all associated CLOs it to be satisfactory based on at least one direct and one indirect assessment. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	CNST 321 CAR – Avg. of Grades for CLO 7, 8, 9 (D)
3. 100% of employers who respond to the Internship Survey will report CM rising senior interns to be either "Moderately knowledgeable" or "Very knowledgeable" in estimating.	CM Intern Employer Survey
4. 100% graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.*	Student Exit Survey

Table 4.26 SLO/PLO #5 - Metrics, Targets, and Assessment Tools

Outcome 5: Create construction project schedules.	
Metrics Associated with Outcome	**Where Measured**
1. CNST 480 – Capstone Project, Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	Capstone Syllabus Capstone Final Project Rubric & CLO Grades (D)
2. CNST 450 – Construction Planning and Scheduling will adopt this outcome into its CLOs and report the overall average of all associated CLOs it to be satisfactory based on at least one direct and one indirect assessment. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	CNST 450 CAR – Avg. of median final exam and semester project grades (D)
3. 100% of employers who respond to the Internship Survey will report CM rising senior interns to be either "Moderately knowledgeable" or "Very knowledgeable" in scheduling.	CM Intern Employer Survey
4. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency*	Student Exit Survey

Table 4.27 SLO/PLO #6 - Metrics, Targets, and Assessment Tools

Outcome 6: Analyze professional decisions based on ethical principles.	
Metrics Associated with Outcome	**Where Measured**
1. 100% of graduating senior will have developed and presented an ethics case that focuses on professional and ethical responsibility.	Course Syllabi CARs
2. CNST 480 – Capstone Project, Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	Capstone Syllabus Capstone Ethics Assignment (D)
3. At least 25% of all CNST courses will include an ethics related course learning outcome in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
4. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.*	Senior Exit Survey
5. Alumni rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.*	Alumni Survey (5 yr out)
6. 100% of surveyed alumni agree or strongly agree that it is as important to be ethical as it is to follow the law.	Alumni Survey (5 yr out)

Table 4.28 SLO/PLO #7 - Metrics, Targets, and Assessment Tools

Outcome 7: Analyze construction documents for planning and management of construction processes.	
Metrics Associated with Outcome	**Where Measured**
1. At least 50% of all CNST classes will include a course learning outcome related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
2. CNST 480 – Capstone Project, Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.5 or above on a 5-point scale on both direct and indirect assessment.*	Capstone Syllabus Capstone Final Project Rubric & CLO Grades (D)
3. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.*	Senior Exit Survey

Table 4.29 SLO/PLO #8 - Metrics, Targets, and Assessment Tools

Outcome 8: Analyze methods, materials, and equipment used to construct projects.	
Metrics Associated with Outcome	**Where Measured**
1. At least 50% of all CNST classes will include a course learning outcome related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
2. CNST 480 – Capstone Project, Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	Capstone Syllabus Capstone Final Project Rubric & CLO Grades (D)
3. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5- point scale where 5 means proficiency.*	Senior Exit Survey
4. 100% of employers who respond to the Internship Survey will report CM rising senior interns to be either “In tune with the requirements” or “Outstanding” in technical skills.	CM Intern Employer Survey

Table 4.30 SLO/PLO #9 - Metrics, Targets, and Assessment Tools

Outcome 9: Apply construction management skills as a member of a multi-disciplinary team.	
Metrics Associated with Outcome	**Where Measured**
1. CNST 445 Construction Project Management and Safety will adopt this outcome into its CLOs and report the overall average of all associated CLOs to be satisfactory based on at least one direct and one indirect assessment. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	CNST 445 CAR – IPD Assignments 1, 2, 3 and the Final Assignment (D)
2. At least three student-led teams will participate in a construction related student competition.	Student Competition info from the CM Club report
3. All graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency*.	Senior Exit Survey
4. 100% of employers who respond to the Internship Survey will report CM rising senior interns to be either “Gets along with others”, “Works well with others” or “Exceptionally well accepted”.	CM Intern Employer Survey
5. At least 10% of all Construction Management seniors will participate in a student team competition where their performance will be externally judged and assessed.	Student Competition info from the CM Club report Capstone Presentations
6. 100% of work eligible CM students will hold at least one construction related employment, internship or co-op during their studies at RWU, prior to graduation.	Senior Exit Survey

Table 4.31 SLO/PLO #10 - Metrics, Targets, and Assessment Tools

Outcome 10: Apply electronic-based technology to manage the construction process.	
Metrics Associated with Outcome	**Where Measured**
1. CNST 480 – Capstone Project, Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	Capstone Syllabus Capstone Final Project Rubric & CLO Grades (D)
2. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency*.	Senior Exit Survey
3. 100% of employers who respond to the Internship Survey will report CM rising senior interns to be either "Extremely" or "Moderately" proficient regarding software program proficiency.	CM Intern Employer Survey
4. At least 50% of all CNST classes will include a course learning outcome related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
5. All estimating and scheduling courses will include at least one electronic based technology related CLO in the course syllabus. CLO will be assessed by at least one direct and one indirect assessment method.	CNST 260 CAR (D) CNST 321 CAR (D) CNST 450 CAR (D)

Table 4.32 SLO/PLO #11 - Metrics, Targets, and Assessment Tools

Outcome 11: Apply basic surveying techniques for construction layout and control.	
Metrics Associated with Outcome:	**Where Measured**
1. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency*.	Senior Exit Survey
2. At least three CNST courses will include a CLO related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
3. CNST 302 – Surveying will adopt this outcome. CNST 302 final course grade mean and/or median will be equal to or higher than 3.75 on a 5-point scale where 5 means proficiency.	CNST 302 CAR – Final Course Grade Avg. (D)

Table 4.33 SLO/PLO #12 - Metrics, Targets, and Assessment Tools

Outcome 12: Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.	
Metrics Associated with Outcome	**Where Measured**
1. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.*	Senior Exit Survey
2. At least 25% of all CNST classes will include a CLO related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
3. At least 10% of all graduating seniors will participate in a student competition.	Student Competition info from the CM Club report Capstone competition
4. 100% of CM students report to have participated in at least one interdisciplinary workshop in collaboration with a non-CM program such as architecture, engineering, business, etc. prior to graduation.	Student Exit Survey
5. CNST 445 – Project Management and Safety will adopt this outcome into its CLOs and report the overall average of all associated CLOs it to be satisfactory based on at least one direct and one indirect assessment. *Satisfactory means a mean and/or median score of 3.5 or above on a 5-point scale on both direct and indirect assessment.*	CNST 445 CAR – Lab #3 Grades (D)

Table 4.34 SLO/PLO #13 - Metrics, Targets, and Assessment Tools

Outcome 13: Understand construction risk management.	
Metrics Associated with Outcome	**Where Measured**
1. CNST 480 – Capstone Project, Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	Capstone Syllabus Capstone Final Project Rubric & CLO Grades (D)
2. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5- point scale where 5 means proficiency.*	Senior Exit Survey
3. At least 25% of all CNST classes will include a CLO related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs

Table 4.35 SLO/PLO #14 - Metrics, Targets, and Assessment Tools

Outcome 14: Understand construction accounting and cost control.	
Metrics Associated with Outcome	**Where Measured**
1. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.*	Senior Exit Survey
2. At least 20% of all CNST classes will include a CLO related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
3. CNST 475 – Construction Project Control will adopt this outcome into its CLOs and report the overall average of all associated CLOs to be satisfactory based on at least one direct and one indirect assessment. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	CNST 475 CAR – CLO 4, 7, 8 Grades (D)

Table 4.36 SLO/PLO #15 - Metrics, Targets, and Assessment Tools

Outcome 15: Understand construction quality assurance and control.	
Metrics Associated with Outcome	**Where Measured**
1. CNST 480 – Capstone Project, Ethics and New Technology will adopt this outcome as a CLO, and its assessment report will list this CLO to be satisfactory based on at least one direct and one indirect assessment report. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	Capstone Syllabus Capstone Final Project Rubric & CLO Grades (D)
2. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. *Proficiency is defined as a mean and median score of 4 or above on a 5- point scale where 5 means proficiency.*	Senior Exit Survey
3. At least 25% of all CNST classes will include a course learning outcome related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs

Table 4.37 *SLO/PLO #16 - Metrics, Targets, and Assessment Tools*

Outcome 16: Understand construction project control processes.	
Metrics Associated with Outcome	**Where Measured**
1. CNST 475 – Construction Project Control will adopt this outcome into its CLOs and report the overall average of all associated CLOs it to be satisfactory based on at least one direct and one indirect assessment. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	CNST 475 CAR – Avg. of Course Final Grades (D)
2. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. Proficiency is defined as a mean and median score of 4 or above on a 5- point scale where 5 means proficiency.	Senior Exit Survey
3. At least 20% of all CNST classes will include a CLO related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs

Table 4.38 SLO/PLO #17 - Metrics, Targets, and Assessment Tools

Outcome 17: Understand the legal implications of contract, common, and regulatory law to manage a construction project.	
Metrics Associated with Outcome	**Where Measured**
1. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.	Senior Exit Survey
2. At least 25% of all CNST classes will include a CLO related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
3. 100% of all CM students will successfully complete at least one legal elective course prior to graduation.	Transcripts
4. CNST 445 – Project Management and Safety will adopt this outcome into its CLOs and report the overall average of all associated CLOs to be satisfactory based on at least one direct and one indirect assessment. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	CNST 445 CAR – Law Case and Law Assignment Grade Avg. (D)

Table 4.39 SLO/PLO #18 - Metrics, Targets, and Assessment Tools

Outcome 18: Understand the basic principles of sustainable construction.	
Metrics Associated with Outcome	**Where Measured**
1. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.	Senior Exit Survey
2. At least 20% of all CNST classes will include a CLO related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
3. At least 5% of graduating seniors will report to have been actively involved with the RWU USGBC Student Group.	Senior Exit Survey
4. The RWU USGBC Student Group will sponsor at least one educational activity focusing on sustainable construction. The activity will be open to all CM students with no restrictions on eligibility to attend.	RWU USGBC Student Group Report
5. CNST 465/540 will adopt this outcome and its final course grade mean and/or median will be 75% or higher.	CNST 465/540 CAR – Avg. of Final Course Grades
6. CNST 445 – Project Management and Safety will adopt this outcome into its CLOs and report the overall average of all associated CLOs it to be satisfactory based on at least one direct and one indirect assessment. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	CNST 445 CAR – Final IPD Grade Avg. (D)

Table 4.40 SLO/PLO #19 - Metrics, Targets, and Assessment Tools

Outcome 19: Understand the basic principles of structural behavior.	
Metrics Associated with Outcome	**Where Measured**
1. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.	Senior Exit Survey
2. At least 20% of all CNST classes will include a CLO related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
3. CNST 304 – Applied Structures will adopt this outcome into its CLOs and report the overall average of all associated CLOs it to be satisfactory based on at least one direct and one indirect assessment. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	CNST 304 CAR (Average of all 7 CLOs) (D)

Table 4.41 SLO/PLO #20 - Metrics, Targets, and Assessment Tools

Outcome 20: Understand the basic principles of mechanical, electrical and piping systems.	
Metrics Associated with Outcome	**Where Measured**
1. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome. Proficiency is defined as a mean and median score of 4 or above on a 5-point scale where 5 means proficiency.	Senior Exit Survey
2. At least 20% of all CNST classes will include a CLO related to this PLO in the syllabus. All CLOs to be assessed using at least one direct and/or indirect assessment in the course assessment reports.	CARs
3. CNST 455 – Mechanical / Electrical Design will adopt this outcome into its CLOs and report average of the semester project grades to be satisfactory based on at least one direct and one indirect assessment. *Satisfactory means a mean and/or median score of 3.75 or above on a 5-point scale on direct and 4 or above on indirect assessment.*	CNST 455 CAR – Semester Project Grades. (D)