



Roger Williams  
University



# **B.S. IN CONSTRUCTION MANAGEMENT PROGRAM ASSESSMENT REPORT AY 2019/2020**

## EXECUTIVE SUMMARY

The assessment review is part of our overall program assessment planning process. It is a critical self-analysis designed to systematically evaluate our program by concentrating on: (1) what it is doing, (2) how well it is operating, and (3) how it can be strengthened

Our process focuses on:

- Assessing the true state of the program
- Identifying our accomplishments
- Identifying areas for improvement and recommending how to implement those improvements
- Developing information to be used for improvement of the program

This report provides the opportunity for stakeholders to review the current state of the Construction Management (CM) undergraduate program at Roger Williams University (RWU). The reporting period covers the academic year starting August 2019 thru July 2020 (AY19/20). The purpose of this report is to focus on assessment of academic activities throughout the year. The data was collected thru a variety of measurements tools to include surveys, interviews, reports, CAR's, and meeting minutes.

AY 2019/2020 was a very busy, challenging, and productive year for the CM program as indicated by the following highlights:

- Student count is at an all-time high with  $\approx$  numbers at 213. This includes a significant number of students transferring from other programs at RWU to include but not limited to engineering, architecture, education, business, and undeclared majors. The increased numbers are good for the overall health of the program but exasperates the problem of a very high student to faculty ratio which manifests itself in more overloads or the need to find qualified faculty to teach the additional sections
- New full-time faculty was hired for start in fall of 2020. Dr. Anne Anderson has joined us from Washington State University. She brings significant full-time teaching experience, expertise in BIM and other 3D technologies, and is a licensed engineer (P.E.)
- New adjunct faculty hired to fill needs in a wide range of courses (100, 130, 200, 201, 250, 445, 455)
- Occupying new lab spaces in the SECCM lab building that will allow us to enhance the lab experience for the student and better support the learning outcomes for the various courses
- Switching to online delivery for all courses in the second half of the spring semester presented the faculty and students with enormous challenges as well as opportunities.
- Competition teams continued to enjoy success in a variety of competitions. For the first year we sent a team to the ASC International Competition in the UK, and much to our delight we finished first in the Quantity Surveying category.
- Students continued to conduct faculty led, funded research in unique areas of interest
- Development of the Emerging Technologies Lab (ETL) as a teaching and research space



**ASC Region 8 International Competition Quantity Surveying – 1<sup>st</sup> Place Team**



**ASC Region 1 Competition Design Build Team 1<sup>st</sup> Place Team**

Michael Emmer, Ph.D. | Construction Management Program(s) Coordinator

## INTRODUCTION

The Construction Management Program is accredited by the American Council for Construction Education (ACCE). The CM program was last reaccredited in spring 2017 and is scheduled to be re-evaluated in fall 2022 or spring of 2023. During each year of accreditation, the program has published an annual assessment report that complies with the assessment and strategic plans.

On an annual basis, the program faculty collectively review the assessment methodology, data collection instruments, and scope of the assessment process. Each faculty is asked to help collect data from specific sources which are then reviewed by the group. The data that is collected from a wide array of sources is the basis of measuring our success in meeting our defined objectives and outcomes as outlined in the SECCM Assessment Plan.

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. In addition, all construction management graduates also earns a Business minor. 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.

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.

## CURRICULUM DESIGN

As previously discussed, the construction management curriculum has been designed around six operative classifications of courses. Each of these classifications 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.

<b>Table 1. General Education Courses</b>		
<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
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
<b>Total Credits</b>		<b>21</b>

### 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.

<b>Table 2. Mathematics and Science Courses</b>		
<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
MATH 124	Basic Statistics	3
MATH 136	Pre-calculus	4
MATH 207	Applied Calculus	3
PHYS 201	Physics I and Lab	4
CHEM 191	Chemistry I and Lab	4
<b>Total Credits</b>		<b>18</b>

### 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.

<b>Table 3. Business and Management</b>		
<b>Course Number</b>	<b>Course Title</b>	<b>Credits</b>
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
<b>Total Credits</b>		<b>18</b>

#### 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.

<b>Table 4. Construction Science</b>		
<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
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 204	Construction Statics	3
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
<b>Total Credits</b>		<b>30</b>

#### 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.

<b>Table 5. Construction</b>		
<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
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 445	Construction Project Management and Lab	4
CNST 450	Construction Planning and Scheduling	3
CNST 475	Construction Project Control	3
CNST 480	Construction Management Capstone	3
CNST XXX	Construction Elective	3
<b>Total Credits</b>		<b>28</b>

#### 6. Other Program Requirements

The Roger Williams University Core Concentration involves 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.

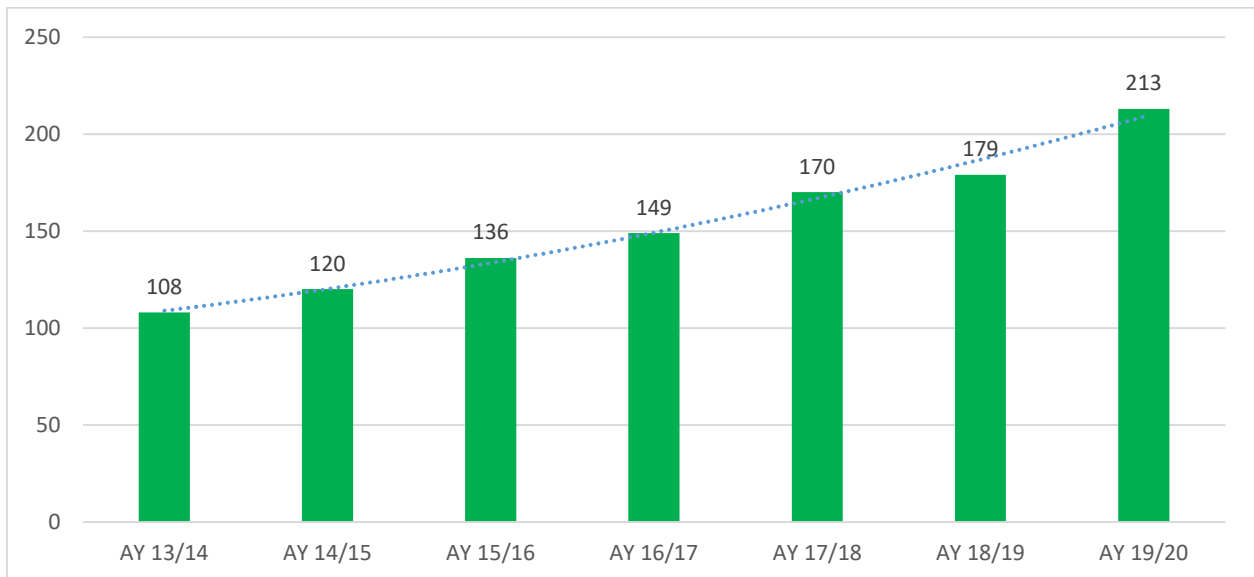
<b>Table 6. Other Program Requirements</b>		
<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	Core Concentration	15
<b>Total Credits</b>		<b>15</b>

## PROGRAM HEALTH AND STATUS

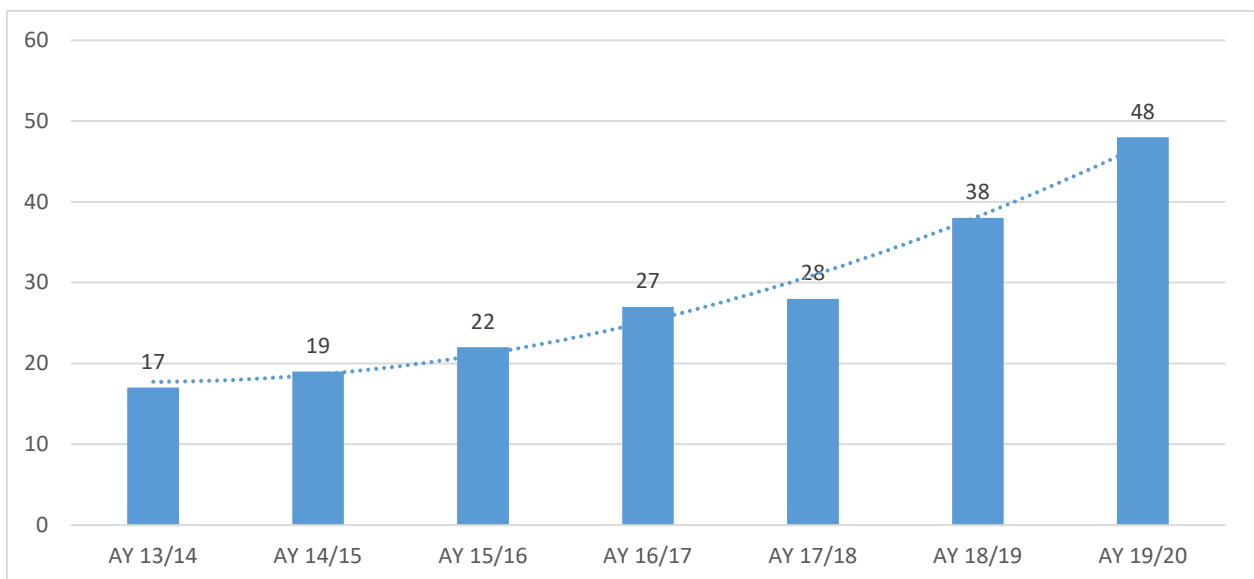
AY 19/20 finds the CM program to be in a very good position to continue to provide top-notch construction education to current and future students. Health of the program is demonstrated by solid enrollment; high graduation rates; student participation in competition teams and clubs; industry participation and support; dedicated faculty; and status amongst peer institutions.

### Enrollment

The CM program is in a very healthy state in terms of enrollment. Program growth has been steady (see Figure 1) over the past seven years with the largest growth rate exhibited from AY 18/19 to AY 19/20. In addition, the incoming freshmen class is the largest ever at 62 students.



**Figure 1. CM Student Population Growth**



**Figure 2. Program Graduates**

Michael Emmer, Ph.D. | Construction Management Program(s) Coordinator



### Industry Participation

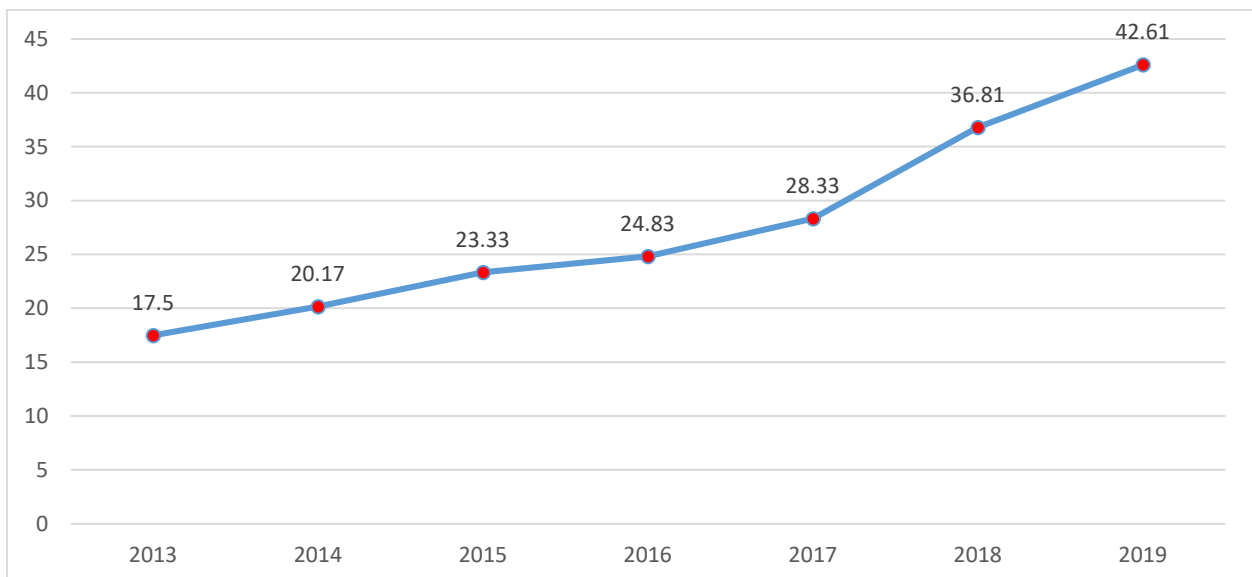
Contractor participation has been superb which is especially evident in the addition of a third mentor for the Capstone course. Many industry professionals have devoted time, money, resources, and support to the program in CM club activities, prepping of competition teams, and donations to support student trips. The Construction Management Professional Advisory Board (CMPAB) has been very active and supporting of efforts to improve the program.

### Academics

With the use of additional spaces in the new SECCM Labs building, we were able to expand the methods and materials labs and development of new technology research in the Emerging Technologies Lab (ETL). Several faculty are working on the addition of new CM electives which will offer the students more choices. The goal is to have three specialization tracks with two courses each:

- Residential Construction and Development
- Heavy-Civil Construction
- Sustainability

The faculty to student ratio (see Figure 3) continues to be an issue however with addition of a new full time faculty in fall of 2020, the ratio will fall to  $\approx 38.0$  which is still one of the highest (if not the highest) on campus.



**Figure 3. Student to Faculty Ratio**

### Faculty

The CM program continues to enjoy a group of passionate and dedicated faculty who work very hard to provide a solid and comprehensive educational experience to prepare graduates for the challenges of the industry. When asked, CM faculty step up to teach overloads so the students' academic plan does get delayed.

## PROGRAM ASSESSMENT

Assessment is achieved thru multiple sources that evaluate the quality of the program from an academic, administrative, student, extracurricular, and industry perspective. All of the following data strongly indicates the program is very strong and headed in the right direction.

Program Size	AY 16/17	AY 17/18	AY 18/19	AY 19/20
Undergraduate Program Population	149	170	179	213
Freshmen Class	51	42	37	56
Senior Class	34	34	44	49
Tenured Faculty	6	6	4	4
Tenure-Track Faculty	0	0	1	1
Number of Students per FT faculty	24.83	28.33	36.80	42.61

**Table 8. Senior Employment Data**

Metric	AY 14/15	AY 15/16	AY 16/17	AY 17/18	AY 18/19	AY 19/20
Average # Internships as Senior	2.74	2.73	2.71	2.80	2.81	2.64
Placement Rate	100%	100%	93%	95%	95%	87%
Salary Range						
Low		\$45,000	\$45,000	\$40,000	\$45,000	\$50,000
High		\$73,200	\$72,000	\$85,000	\$81,700	\$83,700
Mean		\$59,751	\$59,926	\$62,361	\$65,500	\$67,531
Median		\$60,000	\$60,000	\$61,000	\$65,755	\$67,000

**Table 9. Student Competition Results**

Competition Placement	AY 10/11	AY 11/12	AY 12/13	AY 13/14	AY 14/15	AY 15/16	AY 16/17	AY 17/18	AY 18/19	AY 19/20
<b>ASC</b>										
Commercial	DNP	1 <sup>st</sup>	1 <sup>st</sup>	DNP	DNP	2 <sup>nd</sup>	2 <sup>nd</sup>	DNP	DNP	DNP
Design-Build	3 <sup>rd</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	DNP	1 <sup>st</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	DNP	3 <sup>rd</sup>	1 <sup>st</sup>
Heavy-Civil	DNP	3 <sup>rd</sup>	1 <sup>st</sup>	DNP	3 <sup>rd</sup>	2 <sup>nd</sup>	DNP	3 <sup>rd</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
Pre-construction	NA	NA	NA	NA	NA	NA	NA	NA	3 <sup>rd</sup>	NA
National	NA	NA	3 <sup>rd</sup>	NA	NA	NA	Na	NA	2 <sup>nd</sup>	NA
International	Na	NA	NA	NA	NA	NA	NA	NA	NA	1 <sup>st</sup>
<b>DBIA</b>										
Regional									1 <sup>st</sup>	1 <sup>st</sup>
National									DNP	DNP

*Note: Did Not Place (DNP)*

### **Internship Program**

For AY 19/20 the vast majority of CM students had at least one internship experience. The goal for the program is that 75% of the students participate in an internship. Based on the data reported, this objective has been met. Discussions with industry representatives indicate the expectation is that students have at least two meaningful internship experiences on their resume when applying for their first full time job.

### **Student Club Activities**

Student club activity was very strong throughout the program up until the start of the COVID-19 crisis. Since the 2<sup>nd</sup> semester was done entirely online, interaction and work amongst the clubs became severely limited. That said the club was successful accomplishing a few objectives:

- Preliminary teams were formed for the fall competitions
- Two guest speakers presented unique topics

### **Capstone Project**

The Capstone course saw the largest number of students in the history of the program. This year Consigli Construction Company joined us as the third mentor.

### **Senior Exit Interviews**

Senior exit interviews were conducted by the CMPAB chair, John Puniello '97 and Greg Josselyn '11 via an online MS Teams meeting. The following is a summary of the student comments:

#### Program Strengths

Overall, there was broad and consistent feedback regarding the strengths of the program, and the students predominantly agreed on the following:

1. **The Faculty:** The students felt supported and engaged by the faculty, and appreciated the access they had to the faculty if they had any additional questions outside of the classroom. The students also agreed that the faculty was extremely supportive of the competition teams, and put a lot of extra effort in supporting the teams. There was an overwhelming respect and admiration for the faculty and staff.
2. **Program/Coursework:** The students felt well prepared to enter the workforce, and felt the most valuable courses they took were Intro to CM, Methods & Materials, Scheduling, Project Management & Safety Lab, Plans and Specs, and Project Controls. Some classes had industry professionals join as guest lecturers, which the students thought was very beneficial. The students also felt they all gained valuable presentation skills at Roger Williams University, giving many presentations in both Construction Management classes, as well as other core classes.
3. **Career Fair:** The students believed that the career fair was a huge strength to the program that gave them access to internships, and an ability to network with industry leaders. Students from both groups strongly agreed that they would like to return to the University to help build and support the program as industry professionals.
4. **Internships:** Most students participated in at least one construction related internship during their time at the university, with many students having completed internships with several different companies.

### Program Improvements

Students believe that the program was very strong overall, and much of their feedback was less congregated than it was towards the program strengths. Some of the suggestions were at the program level, while other suggestions were at the University level. The following summarizes the major points discussed that students felt should be considered to further improve the program.

1. One complaint from the students was that the new building seemed to have significantly more “break-out” meeting spaces for the engineers to use exclusively, and the students felt they could use more dedicated space for project rooms.
2. Students complained about the university cloud server, and said the system was very unreliable. They believed the lack of software licenses, and the unreliability of the campus network held them back from completing projects on time. Development of a student owned software package was recommended, preloaded on the computers they buy through the University or built into the fee freshmen year.
3. Students would have liked to have some more classes focused on residential construction, and more exposure to heavy highway. Students also noticed that much of the technology they experienced in internships was not being discussed in the classroom, and felt the University could improve in keeping up with industry technology trends. Procore, Bluebeam, P6, and BIM360 were some of the technologies discussed. Structures and Statics were among the classes the students disliked the most.
4. Students felt positively about the program as a whole, but wished there was more space in their schedule, and more construction electives offered. Some students thought it would be interesting if some of the Master level classes could double as an elective.
5. Though the students were very positive overall about the Capstone Projects, and broadly graded their mentors very high, most students wished they could have taken an in-depth tour of the project sites. Though they thought the deliverables were good, the students thought the grading metrics were confusing at times, and that sometimes the mentor’s deliverable did not match-up with the University’s.

### **Associate Construction Exam and Review Course**

Due to the impact of the COVID-19 crisis, the review course did not take place because the access to the exam was not feasible. It is possible that if allowed, our students may elect to take the exam in the fall of 2020. Feedback from the test scores is an important element of our program assessment so adjustments have been made to account for the loss.

### **Research**

A few faculty directed student research projects but no detail was provided as to the nature of the research

### **Freshmen Survey**

AY 19/20 marks the third year in a row the freshmen have been surveyed (n = 63; 97% response rate) in an effort to collect data in support of the assessment and improvement of the following program objectives:

- Recruit and retain exceptionally qualified and diverse faculty and staff to support the program, school, and university objectives
- Maintain a reputation within the local, national, and international communities as a leading provider of construction education
- Data integrated into program objectives and outcomes analysis

### **Faculty Survey**

AY 19/20 is the fifth year in a row faculty have been surveyed to collect data in support of several metrics used in the assessment and improvement of multiple program objectives to include:

- Recruit and retain exceptionally qualified and diverse faculty and staff to support the program, school, and university objectives
- 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
- Embrace a culture of professionalism, innovation, collaboration, diversity, and tolerance
- Maintain convenient, well-equipped, and state-of-the-art facilities and resources that support learning, application, and research
- Data integrated into program objectives and outcomes analysis

### **Alumni Survey**

A survey was sent out to fifteen alumni of the class of 2015 (data integrated into program objectives and outcomes analysis)

### **Senior Exit Survey**

All graduating CM seniors were asked to participate in an online survey of a wide range of aspects of the CM program (data integrated into program objectives and outcomes analysis)

## **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 10 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 have published in the Roger Williams University Undergraduate Catalog in 2020, 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. The Construction Management Program Objectives are consistent with the goals of the University and promote the mission and values of RWU.

<b>Table 10. CM Program Objectives</b>
<p><b>FACULTY AND STAFF:</b> Recruit and retain exceptional and diverse faculty and staff to support program, school, and university objectives.</p>
<p><b>EDUCATIONAL:</b> Three to five years after graduation, we expect that our graduates:</p> <ul style="list-style-type: none"> <li>▪ Demonstrate exemplary cutting edge technical knowledge and skills.</li> <li>▪ Value the concept of life-long learning and continue to grow intellectually while keeping informed of new concepts and developments in the construction process.</li> <li>▪ Are recognized as regional, national, and international construction industry leaders.</li> <li>▪ Always display the highest standards of ethical conduct.</li> </ul>
<p><b>SERVICE:</b> 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.</p>
<p><b>ALUMNI:</b> Grow and maintain an engaged network of alumni to support and advance program mission and goals.</p>
<p><b>STUDENTS:</b> Recruit and retain a committed, qualified, passionate and diverse body of students.</p>
<p><b>CULTURE:</b> Embrace a culture of professionalism, innovation, collaboration, and tolerance.</p>
<p><b>BRANDING:</b> Maintain a reputation within the local, national and international communities as a leading academic provider of construction education.</p>
<p><b>FACILITIES &amp; RESOURCES:</b> Maintain convenient, well equipped, and state-of-the-art facilities and resources to support learning and research.</p>

### **CONSTRUCTION MANAGEMENT PROGRAM OUTCOMES**

Construction Management program outcomes correspond to the knowledge, skills and behavior that 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 Tables 11-21, Construction Management Educational Objectives linked to Construction Management Program Outcomes.

## Assessment of Program Educational Objectives

Below is a detailed assessment of all program objectives. These objectives and their metrics along with our mission statement were published in 2015 after a full year of extensive strategic planning process in collaboration with the program faculty, administration, students, industry advisory board and the alumni.

**Table 11. CM Program Objective #1, Metrics and Targets**

FACULTY AND STAFF			
<i>Objective #1: Recruit and retain exceptional, qualified, and diverse faculty and staff to support program, school, and University objectives.</i>			
Metrics Associated w/Objective	Where Measured	Met	Comments
At least 80% of graduating seniors report to be satisfied or very satisfied with the helpfulness of the CM staff	Senior Exit Survey	Yes	88%
	<b>Action Item:</b> Request a visiting professor position to help with course loads. The program needs at least three more FT faculty to meet the needs of the program growth and development.		
CM faculty and staff demographics are representative of other programs in ASC Region 1	<b>Diversity Stats:</b> The program is still an all-male group with no diversity	No	100% M 0% F 0% B 0% A 0% H
	<b>Action Item:</b> Future hiring searches will focus on increasing the diversity of the faculty.		
At least one academic conference or presentation or journal paper published by 80% of FT tenured or tenure-track faculty.	Faculty Survey	Yes	100%
At least one academic conference presentation or publication co-authored by at least one FT faculty and an undergraduate student.	Faculty Survey	Yes	GC
50% of FT faculty conducted at least one consulting activity for the construction industry or research with industry support or faculty internship.	Faculty Survey	Yes	67%



**Table 12. Program Objective #2, Metrics and Targets**

<b>EDUCATIONAL</b>			
Three to five years after graduation, we expect that our graduates:			
<b>Objective #2: Demonstrate exemplary cutting-edge technical knowledge and skills</b>			
<b>Metrics Associated w/Objective</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
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	Yes	90%
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	Yes	4.44
CM Program Learning Outcomes (PLO) assessment indicates 100% of PLO's to be satisfactory or lists specific action plans to address any PLO's that are indicated as weaknesses	PLO Assessment	Yes	---
At least 80% of the employers report interns: <ul style="list-style-type: none"> <li>- Technical knowledge as outstanding or satisfactory</li> <li>- Estimating skills as outstanding or satisfactory</li> <li>- Scheduling skills as outstanding or satisfactory</li> <li>- CAD or Revit skills as outstanding or proficient</li> <li>- Excel skills as outstanding or proficient</li> </ul>	Employer Internship Survey	Unknown	Due to COVID-19, very few students did internships

**Table 13. Program Objective #3. Metrics and Targets**

<b>EDUCATIONAL</b>			
Three to five years after graduation, we expect that our graduates:			
<b>Objective #3: Value the concept of lifelong learning and continue to grow intellectually while keeping informed of new concepts and developments in the construction process</b>			
<b>Metrics Associated w/Objective</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
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	No	67%
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 of the concept of lifelong learning and continue to grow intellectually while keeping informed of new concepts and developments in the construction process.	Alumni Survey	Yes	100%
At least 50% of CM seniors sit for the AC Level 1 exam	Exam Attendance	No	---
At least of 20% of alumni (5 years out) report to have received a graduate degree or certificate.	Alumni Survey	Yes	22%

**Table 14. Program Objective #4, Metrics and Targets**

<b>EDUCATIONAL</b>			
Three to five years after graduation, we expect that our graduates:			
<b>Objective #4: Are recognized as regional, national, and international leaders in the construction industry</b>			
<b>Metrics Associated w/Objective</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
At least 80% of graduating seniors answer the following question as agree or strongly agree: The CM Program has increased my enthusiasm to become a leader in the construction industry	Senior Exit Survey	Yes	85%
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, or international leader in the construction industry	Alumni Survey	Yes	100%
At least 5% of all RWU alumni with a profile in LinkedIn is holding an executive or higher position in the construction industry	LinkedIn Date	Yes	≈ 25%
At least 1% of all RWU alumni with a profile in LinkedIn has worked or is working in a construction related area outside the US	LinkedIn Data	Unknown	---
At least one RWU CM alumni was nominated as the current academic years' CMPAB Distinguished Person of the Year Award	CM Coordinator	No	None selected this year

**Table 15. Program Objective #5, Metrics and Targets**

<b>EDUCATIONAL</b>			
Three to five years after graduation, we expect that our graduates:			
<b>Objective #5: Always display the highest standards of ethical conduct</b>			
<b>Metrics Associated w/Objective</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
At least 80% of graduating seniors answer the assessment question for PLO #6 (Ethical Principles) as agree or strongly agree	Senior Exit Survey	Yes	81%
At least 80% of graduating seniors answer the following question as agree or strongly agree: It is as important to be ethical as it is to follow the law.	Senior Exit Survey	Yes	95%
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	Yes	89%
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.	Senior Exit Survey	Yes	95%
CM Program PLO assessment indicates PLO #6 to be satisfactory or lists specific action plans necessary to address any PLO's that are indicated as weaknesses	PLO Assessment	Yes	---
Capstone course assessment report indicates that the direct assessment of its ethics CLO is equal to or higher than 80%	Capstone Ethics Outcome	Yes	Direct: 4.2/5 Indirect: 4.4/5

**Table 16. Program Objective #6, Metrics and Targets**

EDUCATIONAL			
Three to five years after graduation, we expect that our graduates:			
Objective #6: Advance the construction management profession by becoming actively involved in professional associations and societies, serving in professional or community volunteer positions, and acting as a role model for future generations of constructors			
Metrics Associated w/Objective	Where Measured	Met	Comments
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	No	55%
At least 50% of alumni 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	No	33%
100% of FT faculty are active members of at least one construction related professional organization	Faculty Survey	No	67%
100% of CM students received Feinstein Service Learning credit prior to graduation	Transcripts	Yes	100%
At least on CM student group was involved with construction related community service	Student Club Reports	No	---
	<b>Action Item:</b> CM club to pursue several opportunities		

**Table 17. Program Objective #7, Metrics and Targets**

EDUCATIONAL			
Three to five years after graduation, we expect that our graduates:			
Objective #7: Recruit and retain a committed, qualified, passionate, and diverse body of students			
Metrics Associated w/Objective	Where Measured	Met	Comments
At least 80% of graduating seniors answer the following question as good or excellent: Please rate the quality of the CM student body	Senior Exit Survey	Yes	95%
Diversity statistics of CM students are comparable to RWU or RI race/ethnic/gender data	Registrar/Institutional Research	Yes	---
	<b>Action Item:</b> Outreach events were put on hold due to COVID-19 restrictions.		
Maintain a minimum of 60% 6-year graduation rate	Census Data/Transcripts	Yes	≈ 70%
At least 10% of all graduating CM students participated in student competitions	Senior Exit Survey	No	COVID-19 restrictions

**Table 18. Program Objective #8, Metrics and Targets**

<b>EDUCATIONAL</b>			
Three to five years after graduation, we expect that our graduates:			
Objective #8: Grow and maintain an engaged network of alumni to support and advance program mission and objectives			
<b>Metrics Associated w/Objective</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
At least 80% of graduating seniors answer the following question as somewhat agree or strongly agree: I am planning to support and advance the program mission and objectives after graduation	Senior Exit Survey	No	79%
At least 80% of alumni answer the following question as "YES": Have you had any direct engagement with the CM program or a faculty member since graduation?	Alumni Survey	No	33%
	<b>Action Item:</b> Increase alumni rate by holding events with different classes. Coordinate with the alumni office for assistance		
At least 50% of the PLO mentors are graduates of the CM program	Not measured	---	---
At least 30% of the CMPAB members are alumni of the program	CMPAB Membership List	Yes	76%
The number of CM Annual Alumni Banquet attendees exceed 80% of the number of students registered in the program as of the preceding Fall semester	---	---	No banquet due to COVID-19
The number of donations to the CMPAB scholarship and the CM programmatic Gift Fund increased compared to the following year	---	---	No additional donations due to no banquet

**Table 19. Program Objective #9, Metrics and Targets**

EDUCATIONAL			
Three to five years after graduation, we expect that our graduates:			
Objective #9: Embrace a culture of professionalism, innovation, collaboration, and tolerance			
Metrics Associated w/Objective	Where Measured	Met	Comments
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	Yes	21%
At least 80% of graduating seniors answer the following question as somewhat agree or strongly agree: RWU CM community encourages and welcomes individuals with different opinions	Senior Exit Survey	Yes	88%
At least 80% of alumni (5 years out) answer the following questions as somewhat agree or strongly agree: The RWU CM community encouraged and welcomed individuals with different opinions	Alumni Survey	No	67%
	<b>Action Item:</b> Better than last year but still a weakness		
At least 80% if employers report their interns: <ul style="list-style-type: none"> <li>- As completely dependable or dependable above average</li> <li>- Quite poised and confident or has appropriate self-assurance</li> <li>- Always on time</li> <li>- Exceptionally well-accepted or works well with others</li> </ul>	Employer Internship Survey	NA	Did not conduct an internship employer survey this year
At least 5% of all CM graduating students participated in faculty led student research outside of class	Faculty Survey	Yes	67%
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	No	Due to COVID-19 and being in Zoom attendance was very poor

**Table 20. Program Objective #10, Metrics and Targets**

<b>EDUCATIONAL</b>			
Three to five years after graduation, we expect that our graduates:			
Objective #10: Maintain a reputation within the local, national, and international communities as a leading academic provider of construction education			
<b>Metrics Associated w/Objective</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
At least 80% of graduating seniors answer the following question as somewhat likely or extremely likely: How likely are you to recommend the CM program to others	Senior Exit Survey	Yes	95%
At least 80% of alumni (5 years out) answer the following question as somewhat agree or strongly agree: I believe the CM program is a leading academic provider of construction education	Alumni Survey	Yes	100%
Social media account followers increased by 50% as compared to the previous AY.	Social Media Club Data	Unknown	No access to current data
	<b>Action Item:</b> Work with IR to better access current data		
At least 80% of all CM freshmen report RWU as their first choice	Freshmen Survey	No	79%
All student teams competing in competitions placed in the top three	CM Club Report	No	DB: 1 <sup>st</sup> CM: DNP HC: 3 <sup>rd</sup>
At least 2 faculty (or faculty led students) to present CM related work at a peer reviewed international conferences	Faculty Survey	Yes	2

**Table 21. Program Objective #11, Metrics and Targets**

<b>EDUCATIONAL</b>			
Three to five years after graduation, we expect that our graduates:			
Objective #11: Maintain convenient, well equipped, and state-of-the-art facilities and resources to support learning and research			
<b>Metrics Associated w/Objective</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
At least 80% of graduating seniors answer the following question as satisfied or very satisfied: Please rate the overall quality of SECCM classrooms and labs	Senior Exit Survey	Yes	81%
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.	Alumni Survey	Unknown	Question mistakenly omitted from survey
100% of CM faculty answer the following statement with somewhat agree or strongly agree: I am satisfied with the SECCM facilities	Faculty Survey	No	33%
No CNST lab section exceeds 16 students and no CNST lecture section exceeds 36 students and no CNST course with a computer software related outcome exceeds 24 students	Registrar	No	Many courses that use software exceed 24 students
<b>Action Item:</b> Look for additional adjuncts so sections can be added			

### Assessment of CM Program Outcomes

*Note: For PLO assessment from the senior exit survey, 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 (n = 42, 88% response rate). Alumni survey was for graduates 5 years out (n = 9, 25% response rate)*

**Table 22. PLO #1: Metrics, Targets, and Assessment Tools**

<b>Outcome #1:</b> Create written communications appropriate to the construction discipline			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
100% of CM students successfully complete at least two writing courses	Transcript	Yes	Mandatory
100% of graduating seniors report that they are proficient in creating written documents appropriate to the construction discipline	Senior Exit Survey	Yes	4.45
At least 50% of all CM courses require "creating written communications appropriate to the construction discipline"	Course Syllabi	Yes	56%
CNST 480: Capstone Project, Ethics, and New Technology has adopted this outcome as a CLO	Capstone Syllabus, Final Grades, Term Project Grading Rubric	Yes	D: 4.55/5 ID: 4.45/5
100% of employers who take a survey will report rising senior interns' writing communication to be either concise, factual, effective, or outstanding	CM Intern Employer Survey	Unknown	Did not conduct a survey this year

**Table 23. PLO #2: Metrics, Targets, and Assessment Tools**

<b>Outcome #2:</b> Create oral presentations appropriate to the construction discipline			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
100% of employers who respond to the Internships survey will report CM rising senior interns to be either clearly communicating ideas or very articulate	CM Intern Employer Survey	Unknown	Did not conduct a survey this year
100% of seniors will have the opportunity in construction classes to make an oral presentation at least twice a semester during their senior year	CAR's	Yes	CNST 445 and CNST 480
100% of all freshmen, sophomore, and juniors will have the opportunity to make an oral presentation in a construction class at least once per year	CAR's	Yes	CNST 100, 116, 200, 201, 260, 450
CNST 480: Capstone will adopt this outcome as a CLO, and in its assessment report will list this CLO to be satisfactory based on at least one direct and on indirect measure of assessment	Capstone Syllabus, Final project grading rubric, course grades	Yes	D: 4.85/5 I: 4.55/5
100% of graduating seniors report that their RWU education has prepared them proficiently in communication skills for the workplace	Senior Exit Survey	Yes	4.86



**Table 24. PLO #3: Metrics, Targets, and Assessment Tools**

<b>Outcome #3:</b> Create a construction project safety plan			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
CNST 480: Capstone will adopt this outcome as a CLO, and in its assessment report will list this CLO to be satisfactory based on at least one direct and on indirect measure of assessment	Capstone Syllabus, Final project grading rubric, course grades	Yes	D: 4.35/5 I: 4.55/5
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 CAR's	Yes	CNST 116, 202, 201, 250, 445, 450, 480
100% of graduating seniors rate their preparation for the safety in the workplace to be proficient	Senior Exit Survey	Yes	4.48

**Table 25. PLO #4: Metrics, Targets, and Assessment Tools**

<b>Outcome #4:</b> Create construction project cost estimates			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
CNST 480: Capstone will adopt this outcome as a CLO, and in its assessment report will list this CLO to be satisfactory based on at least one direct and on indirect measure of assessment	Capstone Syllabus, Final project grading rubric, course grades	yes	D: 4.15/5 I: 4.25/5
CNST 321: Advanced Building Estimating will adopt this outcome as one of its CLO's and report the overall average of all associated CLO's to be satisfactory based on at least one direct and one indirect measure of assessment	CAR: average of grades	Yes	D: 4.12/5 I: 4.27/5
90% of employers who respond to the Internship survey will report rising senior interns to be either moderately knowledgeable or very knowledgeable in estimating	CM Intern Employer Survey	Unknown	Did not conduct a survey this year
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	Yes	4.26

**Table 26. PLO #5: Metrics, Targets, and Assessment Tools**

<b>Outcome #5:</b> Create construction project schedules			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
CNST 480: Capstone will adopt this outcome as a CLO, and in its assessment report will list this CLO to be satisfactory based on at least one direct and on indirect measure of assessment	Capstone Syllabus, Final project grading rubric, course grades	Yes	D: 4.15/5 I: 4.25/5
CNST 450: Construction Planning and Scheduling will adopt this outcome in its CLO's and report the overall average of all associated CLO's to be satisfactory based on at least one direct and one indirect measure	CAR: average of final exam and term project grades	Yes	4.07
100% of employers who respond to the Internship survey will report rising senior interns to be either moderately knowledgeable or very knowledgeable in scheduling	CM Intern Employer Survey	Unknown	Did not conduct a survey this year
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	Yes	4.52

**Table 27. PLO #6: Metrics, Targets, and Assessment Tools**

<b>Outcome #6:</b> Analyze professional decisions based on ethical principles			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
100% of graduating seniors will have developed and presented an ethics case that focuses on professional and ethical responsibility	Course Syllabi CAR's	Yes	All capstone students had an ethics presentation
CNST 480: Capstone will adopt this outcome as a CLO, and in its assessment report will list this CLO to be satisfactory based on at least one direct and on indirect measure of assessment	Capstone Syllabus, Final project grading rubric, course grades	Yes	D: 4.40/5 I: 4.20/5
At least 25% of all CNST courses will include an ethics related CLO which will be assessed using at least one direct and one indirect measure	CAR's	Yes	CNST 100, 321, 445, 475, 480
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	No	3.98
Alumni rate their preparation for the workplace proficient regarding this outcome	Alumni Survey	Yes	4.44
100% of surveyed alumni agree or strongly agree this it is as important to be ethical as it is to follow the law	Alumni Survey	Yes	100%
90% of graduating seniors agree or strongly agree that it is as important to be ethical as it is to follow the law	Senior Exit Survey	Yes	95%

**Table 28. PLO #7: Metrics, Targets, and Assessment Tools**

<b>Outcome #7:</b> Analyze construction documents for planning and management of construction processes			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
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.	CAR's	Yes	CNST 100, 116, 130, 200, 201, 260, 321, 450, 455, 480
CNST 480: Capstone will adopt this outcome as a CLO, and in its assessment report will list this CLO to be satisfactory based on at least one direct and on indirect measure of assessment	Capstone Syllabus, Final project grading rubric, course grades	Yes	63%
100% of graduating seniors rate their preparation for the workplace proficient; agree or strongly agree	Senior Exit Survey	Yes	4.60

**Table 29. PLO #8: Metrics, Targets, and Assessment Tools**

<b>Outcome #8:</b> Analyze methods, materials, and equipment used to construct projects			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
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.	CAR's	Yes	CNST 130, 200, 201, 250, 450, 455, 480, 210
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	Capstone Syllabus, Final project grading rubric, course grades	Yes	D: 4.35/5 I: 4.10/5
3. 100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	Yes	4.45
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	Unknown	Did not conduct a survey this year

**Table 30. PLO #9: Metrics, Targets, and Assessment Tools**

<b>Outcome #9:</b> Apply construction management skills as a member of a multi-disciplinary team			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
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	CAR IPD assignments 1, 2, 3 Final Assignment	Yes	D: 4.15/5 I: 4.21/5
At least three student-led teams will participate in a construction related student competition	CM Club Report	Yes	3
All graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	Yes	4.50
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	Unknown	Did not conduct a survey this year
At least 10% of all Construction Management seniors will participate in a student team competition where their performance will be externally judged and assessed	CM Club Report Capstone Presentations	Yes	38%
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	Yes	---

**Table 31. PLO #10: Metrics, Targets, and Assessment Tools**

<b>Outcome #10:</b> Apply electronic based technology to manage the construction process			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
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	Capstone Syllabus, Final project grading rubric, course grades		
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	Yes	4.05
	<b>Action Item:</b> Need to identify why this was scored low since the students are exposed to numerous software programs in a wide range of classes		
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	Unknown	Did not conduct a survey this year
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	CAR’s	Yes	CNST 116, 130, 260, 321, 450, 455, 475, 480
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.	CAR’s	Yes	RS Means, On-Screen, MS Project

**Table 32. PLO #11: Metrics, Targets, and Assessment Tools**

<b>Outcome #11:</b> Apply basic surveying techniques for construction layout and control			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome.	Senior Exit Survey	No	3.79
	<b>Action Item:</b> Only 71% of the surveyed students believe they achieved this PLO. PC will look into course structure and how the CLO’s are being taught and assessed.		
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.	CAR’s	Yes	CNST 116, 130, 201L, 302
CNST 302 –Surveying will adopt this outcome. Final course grade mean and/or median will be equal to or higher than 4.00 on a 5-point scale where 5 means proficiency.	CAR Final Course Grade Average	No	D: Unknown ID: 3.91

**Table 33. PLO #12: Metrics, Targets, and Assessment Tools**

<b>Outcome #12:</b> Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	Yes	4.48
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.	CAR's	Yes	CNST 100, 130, 260, 445
At least 10% of all graduating seniors will participate in a student competition.	CM Club Report Capstone competition	Yes	38%
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	Senior Exit Survey	Yes	100% Mandatory in CNST 445 with architecture
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.	CAR's Lab Grades	Yes	D: 4.15/5 I: 4.21/5

**Table 34. PLO #13: Metrics, Targets, and Assessment Tools**

<b>Outcome #13:</b> Understand construction risk management			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
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.	Syllabus Final project rubric CLO grades	Yes	D: 4.05/5 I: 4.15/5
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	Yes	4.38
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	CAR's	Yes	CNST 100, 130, 321, 450, 445, 475, 480

**Table 35. PLO #14: Metrics, Targets, and Assessment Tools**

<b>Outcome #14:</b> Understand construction accounting and cost control			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	Yes	4.12
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	CAR's	Yes	CNST 116, 250, 445, 475
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.	CAR CLO 4, 4, 8 grades	Yes	4.18

**Table 36. PLO #15: Metrics, Targets, and Assessment Tools**

<b>Outcome #15:</b> Understand construction quality assurance and control			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
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	Syllabus Final project rubric CLO grades	Yes	D: 4.55/5 I: 4.13/5
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	Yes	4.57
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.	CAR's	Yes	CNST 302, 450, 450, 475, 480

**Table 37. PLO #16: Metrics, Targets, and Assessment Tools**

<b>Outcome #16:</b> Understand construction project control processes			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
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.	CAR Average of final grades	Yes	4.18
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome.	Senior Exit Survey	Yes	4.21
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	CAR's	Yes	CNST 116, 450, 445, 475

**Table 38. PLO #17: Metrics, Targets, and Assessment Tools**

<b>Outcome #17:</b> Understand the legal implications of contract, common, and regulatory law to manage a construction project			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome	Senior Exit Survey	No	3.86
	<b>Action Item:</b> BUSN 305 or LS 220 simply do not help the students understand the concepts. Ask the law school to increase the credits for CLAW 637 from 2 to 3 to give students another option.		
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	CAR's	Yes	CNST 100, 130, 200, 445
100% of all CM students will successfully complete at least one legal elective course prior to graduation.	Transcripts	Yes	BUSN 305 or LS 220
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.	CAR Law assignment grade average	Yes	D: 4.15/5 I: 4.21/5
	<b>Action Item:</b> ME to contact Greg Bowman to help with law case reviews		



**Table 39. PLO #18: Metrics, Targets, and Assessment Tools**

<b>Outcome #18:</b> Understand the basic principles of sustainable construction			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome.	Senior Exit Survey	Yes	4.50
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 report	CAR	Yes	CNST 100, 200, 260, 445, 455
At least 5% of graduating seniors will report to have been actively involved with the RWU USGBC Student Group.	Senior Exit Survey	Yes	12%
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.	Club Report	No	None
CNST 465/540 will adopt this outcome and its final course grade mean and/or median will be 75% or higher	CAR Final Course Grades	Yes	Mean: 82%
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.	CAR Average grade of SUST Lab and forum	Unknown	---

**Table 40. PLO #19: Metrics, Targets, and Assessment Tools**

<b>Outcome #19:</b> Understand the basic principles of structural behavior			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome.	Senior Exit Survey	Yes	4.26
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	CAR's	Yes	CNST 130, 200, 201, 204, 304
CNST 430 SPTP (now CNST 204) –Construction Statics 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.	CAR Average of CLO's	No	D: Unknown I: 3.66/5
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.	CAR Average of CLO's	No	D: 3.85/5 I: 3.9/5
	<b>Action Item:</b> Program will look at combining 204 and 304 after one more complete cycle of teaching the two courses		

**Table 41. PLO #20: Metrics, Targets, and Assessment Tools**

<b>Outcome #20:</b> Understand the basic principles of mechanical, electrical, and piping systems			
<b>Metrics Associated w/Outcome</b>	<b>Where Measured</b>	<b>Met</b>	<b>Comments</b>
100% of graduating seniors rate their preparation for the workplace proficient regarding this outcome.	Senior Exit Survey	Yes	4.38
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	CAR	Yes	CNST 130, 201, 321, 455
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.	CAR Term Project Grades	Yes	D: 4.65/5 I: 4.75/5

**Table 42. Summary Analysis of Program Learning Outcomes**

PLO #	Description	0-5	Somewhat Agree or Strongly Agree
1	Create written communications appropriate to the construction discipline	4.45	98%
2	Create oral presentations appropriate to the construction discipline	4.86	88%
3	Create a construction project safety plan	4.48	95%
4	Create construction project cost estimates	4.26	86%
5	Create construction project schedules	4.52	93%
6	Analyze professional decisions based on ethical principles	3.98	81%*
7	Analyze construction documents for planning and management of construction processes	4.60	93%
8	Analyze methods, materials, and equipment used to construct projects	4.45	93%
9	Apply construction management skills as a member of a multi-disciplinary team	4.50	90%
10	Apply electronic based technology to manage the construction process	4.05	76%
11	Apply basic surveying techniques for construction layout and control	3.79	71%*
12	Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design/construction process	4.48	93%
13	Understand risk management <sup>1</sup>	4.38	95%
14	Understand construction accounting and cost control	4.12	79%
15	Understand quality assurance and control	4.57	95%
16	Understand project control processes	4.21	81%
17	Understand the legal implications of contract, common, and regulatory law to manage a construction project	3.86	76%*
18	Understand the basic principle of sustainable construction	4.50	88%
19	Understand the basic principles of structural behavior	4.26	85%
20	Understand the basic principles of mechanical, electrical, and piping systems	4.38	93%
	<b>Average</b>	<b>4.34</b>	<b>87%</b>

### Assessment of Previously Implemented Program Changes

Curriculum changes were made and approved this year:

- ENGR 210, Applied Statics was changed to CNST 204, Applied Statics for Construction
- Permanent number for Residential Construction: CNST 461
- Permanent number for BIM: CNST 462/562
- Permanent number for heavy civil estimating: CNST 463
- Made minor changes to the CM minor in terms of required and/or elective courses

### Discussion of Recommended Program Changes

Recommended curriculum changes for next year:

- Combine statics and structures into one course
  - o Faculty agreed to postpone until one more cycle of statics and structures is taught