

**SELF-EVALUATION STUDY  
for ACCE Accreditation**



**Bachelor Degree in Construction Management  
Department of Civil and Environmental Engineering &  
Construction**

**Howard R. Hughes College of Engineering  
University of Nevada, Las Vegas**

**Submitted by**

**Sajjad Ahmad and Pramen Shrestha**

## TABLE OF CONTENTS

<b>OVERVIEW</b>	<b>4</b>
<b>1. INTRODUCTION</b>	
Degree Program Name	5
<b>1.1 Requirements</b>	<b>5</b>
<b>1.1.1 Institution and Degree Program Eligibility</b>	<b>5</b>
<b>2. GOVERNANCE AND ADMINISTRATION</b>	
<b>2.1 Requirements</b>	<b>20</b>
<b>2.1.1 Institutional Organizational Structure</b>	<b>20</b>
<b>2.1.2 Educational Unit Autonomy, Structure and Leadership</b>	<b>27</b>
<b>2.1.3 Faculty Participation</b>	<b>28</b>
<b>2.1.4 Contribution to the Institution</b>	<b>28</b>
<b>3. CURRICULUM</b>	<b>30</b>
<b>3.1 Requirements</b>	<b>30</b>
<b>3.1.1 Degree Programs</b>	<b>31</b>
<b>3.1.2 General Education</b>	<b>33</b>
<b>3.1.3 Business and Management</b>	<b>33</b>
<b>3.1.4 Construction</b>	<b>36</b>
<b>3.1.5 Student Learning Outcomes</b>	<b>44</b>
<b>3.2 Courses Delivered by alternative Forms of Delivery</b>	<b>55</b>
<b>3.3 Multiple Campus Degree Program Delivery</b>	<b>55</b>
<b>3.4 Dual or Second Degrees</b>	<b>56</b>
<b>4. FACULTY AND STAFF</b>	<b>57</b>
<b>4.1 Requirements</b>	<b>57</b>
<b>4.1.1 Faculty Qualifications</b>	<b>57</b>
<b>4.1.2 Faculty Size</b>	<b>58</b>
<b>4.1.3 Faculty Workload</b>	<b>58</b>
<b>4.1.4 Administrative and Technical Staff Support</b>	<b>61</b>
<b>4.1.5 Employment Policies</b>	<b>62</b>
<b>4.1.6 Professional Development</b>	<b>63</b>
<b>4.1.7 Faculty Evaluation</b>	<b>63</b>
<b>5. STUDENT POLICIES</b>	<b>67</b>
<b>5.1 Requirements</b>	<b>67</b>
<b>5.1.1 Academic Policies</b>	<b>67</b>
<b>5.1.2 Teaching Quality</b>	<b>67</b>

5.1.3	Admissions and Enrollment	68
5.1.4	Recruitment and Composition	68
5.1.5	Academic Advising and Mentoring	69
5.1.6	Course Scheduling	70
5.1.7	Student Placement	71
5.1.8	Extracurricular Activities	73
5.1.9	Student Feedback	76
5.1.10	Financial Aid and Scholarships	76
<b>6.</b>	<b>PHYSICAL RESOURCES</b>	<b>77</b>
6.1	Requirements	77
6.1.1	Offices, Classrooms and Laboratory Spaces	77
6.1.2	Library Resources	81
6.1.3	Information Systems and Technological Equipment	73
<b>7.</b>	<b>FINANCIAL RESOURCES</b>	<b>85</b>
7.1	Requirements	85
7.1.1	Budgeted Funds	85
7.1.2	Nonrecurring Funds	87
<b>8.</b>	<b>INDUSTRY, ALUMNI, AND PUBLIC RELATIONS</b>	<b>88</b>
8.1	Requirements	88
8.1.1	Support from Industry	88
8.1.2	Support for Industry	88
8.1.3	Student-Industry Relations	92
8.1.4	Alumni Relations and Feedback	93
8.1.5	Public Disclosures	94
<b>9.</b>	<b>ACADEMIC QUALITY PLANNING PROCESS AND OUTCOME ASSESSMENT</b>	<b>95</b>
9.1	Requirements	95
9.1.1	Continuous Improvement	95
9.1.2	Educational Unit Strategic Plan	95
9.1.3	Degree Program Assessment Plan	96
9.1.4	Assessment Implementation Plan	100
<b>10.</b>	<b>REVIEW OF LAST VISITING TEAM’S REPORT: WEAKNESSES AND CONCERNS</b>	
10.1	Previous Accreditation Actions	120

# University of Nevada, Las Vegas

## Construction Management Bachelor Degree

### OVERVIEW

#### The Self-Evaluation Study

This Self-Evaluation Study is being submitted within the time frames specified by ACCE Document 101 for an accredited program

#### Purposes

The Self-Evaluation Study:

- i) guides the degree program and its education unit through a critical review of its operations,
- ii) provides information to ACCE so that a fair evaluation of the degree program can be made, and
- iii) serves as an historical document for the construction education unit.

Submitted by:

Name of Educational Institution: University of Nevada, Las Vegas (UNLV)

---

Name of Educational Unit: Civil and Environmental Engineering & Construction

---

Title of the Degree Program: Bachelor of Science in Construction Management

---

# **1. INTRODUCTION**

## **DEGREE PROGRAM NAME**

Formal degree title name: Bachelor of Science in Construction Management

### **1.1 Requirements**

#### **1.1.1 INSTITUTION AND DEGREE PROGRAM ELIGIBILITY**

1.1.1.1 The degree program is to be located in an educational institution of higher learning that is legally authorized under applicable laws to provide a degree program of education beyond that of the secondary level. Provide background information on the institution, educational unit and the degree program as it relates to history, mission, size, accreditation, etc.

The University was founded originally as the southern regional division of the University of Nevada by action of the Nevada Board of Regents. In 1957, the university opened its first classrooms and administration building, to a class of 300 students. The university's first commencement ceremonies were conducted in 1964. In 1965, the Nevada Legislature renamed the school as Nevada Southern University and authorized the hiring of its first president. In 1968, the University was granted autonomy within the state's higher education system, receiving a status equal to the University of Nevada, Reno. In 1969, the present name of University of Nevada, Las Vegas, was approved. Continual expansion in terms of programs, facilities, and influence has characterized the university since its modest start. Today, the campus encompasses 335 acres. In the fall of 2019, it enrolled 31,171 students, of which, 25,830 were in undergraduate programs, 4,387 were in graduate degree programs, and 977 were professional students (dental, law, medicine). State residents comprise 84.4 percent of the student body. Seventy-two percent students are enrolled full time.

Fifty-seven percent of UNLV's degree-seeking undergraduate students report being part of a racial or ethnic minority. Women represent 57.2 percent of the student body. Students greater than 25 years of age account for 29 percent of the student body. UNLV has more than 3,500 faculty and staff, and offers more than 290 bachelors', master's, and doctoral degree programs and 100 certificate programs. This includes a new School of Medicine and internationally and nationally recognized programs in hotel administration, engineering, business, creative writing, conflict resolution, legal writing, public health, and nursing.

The University of Nevada, Las Vegas (UNLV) is a public research institution committed to rigorous educational programs and promoting well-being and achievement through education, research, scholarship, and creative activity.

UNLV graduates are dedicated to meeting the challenges brought on by rapid urban growth, economic and cultural diversity, and sustainability, and overwhelmingly choose to remain in Southern Nevada. Two-thirds of UNLV's 120,000 alumni reside here, including more than 5,000 K-12 teachers; 9,000 hotel and tourism professionals; and thousands of health care professionals, business owners, and managers. Eighty percent of Boyd School of Law graduates remain in state. UNLV's School of Dental Medicine students provide millions of dollars in free dental services to those in need.

The university strives to create an environment conducive to academic success – from the day students arrive for orientation, during their time on campus and into their chosen careers. This includes a growing Honors College, an innovative curriculum with a defined course path for undergraduates, and access to academic and career advising – including a dedicated Academic Success Center. An array of research opportunities for undergraduate and graduate students strengthen the academic experience and allow students to tackle pressing real-world issues alongside top faculty.

Accredited by the Northwest Commission on Colleges and Universities, UNLV is among the nation's most diverse campuses for undergraduates, with more than half of its students from racial or ethnic minority groups. UNLV is a Minority-Serving and Hispanic-Serving Institution, as designated by the U.S. Dept. of Education. With nearly 1,900 active-duty military and veteran students, the university is also recognized as a military friendly university with a dedicated office to help students and their families navigate the academic and administrative pathways of a college education.

UNLV recently attained R1 “very high research activity” status from the Carnegie Classification of Institutions of Higher Education. UNLV is now one of 130 institutions—out of 4,000 colleges and universities nationwide—to hold R1 status, the gold standard for university research metrics.

UNLV is continuing toward its broader Top Tier vision to become one of the nation's premier public universities in research, education, and community impact by 2025. UNLV continues to attract top students and faculty, educate a diversifying population and workforce, and drive economic activity through innovation, research and community partnerships.

## **Academic Highlights**

UNLV is home to:

**Brookings Mountain West**, a partnership between UNLV and the prestigious Washington, D.C.-based Brookings Institution, brings high-quality, independent, and impactful research to issues facing the dynamic and fast-growing Intermountain West.

**The Lincy Institute** conducts and supports research focused on improving Nevada's health, education, and social services. This research builds capacity for service providers and enhances efforts to draw state and federal money to the greater Las Vegas. The Institute also highlights key issues that affect public policy and quality-of-life decisions on behalf of children, seniors, and families in Nevada.

The renowned **Black Mountain Institute** recently marked its tenth year as a literary center dedicated to promoting discourse on today's most pressing issues. Among its many programs, the institute operates the nation's first City of Asylum program, a safe haven for writers whose voices are muffled by censorship, or who are living with the threat of imprisonment or assassination.

The **Lee Business School** is one of the largest schools at UNLV. Accredited by the Association to Advance Collegiate Schools of Business, it is one of only 189 business schools worldwide to achieve accreditation for both its business school and accounting program, marking the highest standard of achievement for business schools.

The **College of Education** is committed to preparing professionals for diverse educational settings and contributing to educational and pedagogical knowledge through scholarly endeavors. The College stimulates an intellectual environment that promotes quality instruction, significant research, and professional service.

The **Howard R. Hughes College of Engineering** produces graduates who are well prepared to find real-world solutions to technical challenges. The undergraduate program affords students the opportunity to participate in undergraduate research and learn principles of entrepreneurship in addition to the theory taught in the classroom. Faculty and students conduct research in areas such as renewable energy, transportation, nanotechnology and structures.

The **College of Fine Arts** is one of the most rapidly growing and largest fine arts programs in the country. Students are trained by some of the best professionals in the field of entertainment. Faculty and alumni of the fine arts program have won national acclaim, receiving Emmy, Grammy, and Showtime awards.

The **Division of Health Sciences** is comprised of the schools of Dental Medicine, Nursing, Public Health, and Allied Health. Guided by a mission that demands UNLV serve its community, the division is using research, education, training and service to form unique public and private partnerships. These partnerships help provide quality healthcare to the underserved, educate future professionals, and explore ways to improve the health and well-being of our citizens.

The **Honors College** is a selective undergraduate college that offers a unique liberal arts and sciences experience for high-achieving and highly motivated students. Coupled with

the extensive research and cultural opportunities of a large urban university, the Honors College offers an exceptional value in higher education. The College is an educational partner with the “discipline” colleges of the University in which Honors students pursue their academic majors. The combination of a central Honors intellectual core and specialized learning in a major discipline helps develop graduates who are fully prepared to succeed in graduate and professional schools and in rewarding careers.

The **William F. Harrah College of Hospitality** is a global leader in hospitality research and education, immersing its students in the art, science, and business of this dynamic industry. UNLV, with its location in Las Vegas, offers students world-class opportunities to acquire professional experience along with a highly ranked academic degree. The college consistently ranks as one of world’s best, according to QS World University Rankings.

The **William S. Boyd School of Law** at UNLV is a vibrant community of students and scholars who are developing conscientious, skilled, engaged lawyers who can tackle the multifaceted issues that confront cities throughout the Intermountain West and the rest of the country. The nation’s top-ranked legal writing program, its nationally ranked clinical program, the Thomas and Mack Legal Clinic, and the Saltman Center for Conflict Resolution, along with an outstanding faculty and a culture of student involvement and support are key opportunities available to students.

The **College of Liberal Arts**, the largest academic college at UNLV, offers a rich variety of majors and interdisciplinary programs in the liberal arts. Students develop an array of intellectual skills and a diverse understanding of broad and varied issues.

The UNLV **School of Medicine** welcomed its charter class in summer 2017. The medical school's mission is to improve access to high-quality health care in Southern Nevada by increasing the number of physicians and trained specialists who are committed to serving the region. The accompanying academic health center serves as core infrastructure for the entire local medical community and generate top-quality research spanning basic and clinical sciences.

The **College of Sciences** develops students and nurtures faculty who generate knowledge at the forefront of science. The discovery and understanding of the physical world, including biological systems, the investigation of alternative energy resources and fundamental questions concerning the origin and evolution of the earth and the universe are key subject areas in the college’s curriculum.

The **Greenspun College of Urban Affairs** emphasizes improvement of the quality of urban life through preparing students for professional practice in each of its disciplines. College faculty, students, and staff make a difference in the world by developing effective and original solutions for 21st century urban challenges. Students are developing unique solutions together with outstanding faculty and many local leaders.



## **The Mission Statement of the University:**

The University of Nevada, Las Vegas is an R1 research institution committed to rigorous educational programs and the highest standards of a liberal education. We produce accomplished graduates who are well prepared to enter the work force or to continue their education in graduate and professional programs. Our faculty, students, and staff enthusiastically confront the challenges of economic and cultural diversification, urban growth, social justice, and sustainability. Our commitment to our dynamic region and State centrally influences our research and educational programs, which improves our local communities.

Our commitment to the national and international communities ensures that our research and educational programs engage both traditional and innovative areas of study and global concerns. UNLV's distinctive identity and values permeate a unique institution that brings the best of the world to our region and, in turn, produces knowledge to improve the region and world around us.

## **UNLV's Top Tier Vision**

By 2025, UNLV will be recognized as a top tier public university in research, education, and community impact.

## **UNLV's Top Tier Mission**

UNLV's diverse faculty, students, staff, and alumni promote community well-being and individual achievement through education, research, scholarship, creative activities, and clinical services. We stimulate economic development and diversification, foster a climate of innovation, promote health, and enrich the cultural vitality of the communities that we serve.

We use metrics to guide our efforts and determine priorities. While each core theme/pathway goals have an articulated list of metrics, the following Key Metrics (included within the core theme/pathway goals) guide our efforts at an institutional level, exemplifying our Top Tier vision and guiding activity across all units.

- retention
- graduation rates
- research expenditures
- non-faculty researchers
- doctoral degrees conferred
- community impact

## **Diversity, Equity, and Inclusion**

Diversity, equity, and inclusion are guiding principles and central to our work. At UNLV, we focus on creating a caring community that supports the successes of our students and faculty. Students educated in racially and ethnically diverse setting perform better academically, are more likely to graduate in four years, and reap great professional and economic success in the workplace than peers from more homogeneous learning environments.

The advantage of a multicultural education extends well beyond a student's time in school and entry into the workforce. Extending the aspirations of democracy is dependent on the capabilities and compassion of our next generation of leaders—leaders who can effectively engage with individuals and groups across the spectrum of human uniqueness.

These factors make any and all diversity, equity, and inclusion efforts beneficial and worthwhile. Important indicators include designations for AANAPISI, HSI, and MSI and applications for additional funding to support our diverse student body. We also use data on student access and success, and on closing the achievement gap for underserved student populations. We will continue to build out a compendium of performance indicators for staff, which will include, but is not limited to, elements such as climate, gender, and race/ethnicity.

## **UNLV's Core Themes**

### **Core Theme/Pathway Goal 1 – Student Achievement**

**Goal:** UNLV recruits, retains, and graduates a diverse body of students through innovative learning experiences, access to mentoring and research opportunities, and the vibrant campus community.

#### **Objectives and Metrics**

**Objective 1:** Improve student outcomes.

**Metrics:** milestone enrollment, learning outcomes survey, senior exit survey, milestone GPA

**Objective 2:** Increase undergraduate retention.

**Metrics:** freshman retention rate, student to advisor ratio, co-curricular student engagement activities attendance, undergraduate research participants

**Objective 3:** Increase undergraduate graduation rate.

**Metrics:** graduation rate, online course enrollment

## **Core Theme/Pathway Goal 2 - Research, Scholarship, and Creative Activity**

**Goal:** UNLV fosters a climate of innovation in which faculty and students produce high-quality, widely disseminated, and influential research, scholarship, and creative activities.

### **Objectives and Metrics**

**Objective 1:** Increase research activity to benefit the local community, state, and nation.

**Metrics:** research expenditures, faculty publications, faculty supported by grants, patents

**Objective 2:** Increase scholarly activity to benefit the local community, state, and nation.

**Metrics:** non-faculty researchers and postdocs, doctoral degrees, graduate student enrollment, graduate assistantships, graduate publications, graduate presentations and poster presentations

**Objective 3:** Increase creative activity to benefit the local community, state, and nation.

**Metrics:** publications, presentations, and innovations in artistic disciplines; graduate exhibitions, performances, and public readings

## **Core Theme/Pathway Goal 3 - Academic Health Center**

**Goal:** The Academic Health Center (AHC) fosters a dynamic, humanistic environment that 1) promotes an innovative curriculum that prepares a collaborative practice-ready workforce; 2) advances a synergistic pathway toward excellence in research and scholarship; 3) fosters collaborative, comprehensive person-centered clinical services; and 4) stimulates reciprocal community engagement that enhances the visibility and demonstrates the value of the Academic Health Center.

### **Objectives and Metrics**

**Objective 1:** Provide health care delivery and community service. Metrics: patient visits, patient satisfaction

**Objective 2:** Develop a practice-ready workforce.

**Metrics:** health-related degrees awarded, diversity and inclusion training

## **Core Theme/Pathway Goal 4 - Community Partnerships**

**Goal:** UNLV stimulates economic development and diversification, fosters a climate of innovation, and enriches the cultural vitality of the communities that we serve.

**Objective 1:** Create community connections.

**Metrics:** community partners and projects, service-learning courses, service hours, cultural activities attendance, arts-oriented community engagement projects

**Objective 2:** Cultivate a climate of innovation.

**Metrics:** disclosures submitted, startup (techs), new business starts, Small Business Development Center jobs created and clients served

The Howard R. Hughes College of Engineering provides research and academic programs to more than 2000 full-time equivalent undergraduate and graduate students. The College has 70 full-time faculty (excluding military faculty) and numerous adjunct faculty in five departments.

The degrees granted through five departments and programs are:

- **Civil and Environmental Engineering and Construction**
  - B.S.E. – Civil Engineering
  - B.S. – Construction Management
  - M.S.E. – Civil Engineering
  - M.S. – Construction Management
  - M.S.T. – Transportation
  - Ph.D. – Civil and Environmental Engineering
- **Computer Science**
  - B.A. – Computer Science
  - B.S. – Computer Science
  - M.S.C.S. – Computer Science
  - Ph.D. – Computer Science
- **Electrical and Computer Engineering**
  - B.S.E. – Electrical Engineering
  - B.S.E. – Computer Engineering
  - M.S.E. – Electrical Engineering
  - Ph.D. – Electrical Engineering
  - Dual Degree: Master of Science in Engineering - Electrical Engineering & Master of Science - Mathematical Sciences
  - Dual Degree: Doctor of Philosophy - Electrical Engineering & Master of Science - Mathematical Sciences
- **Entertainment Engineering and Design**
  - B.S. – Entertainment Engineering and Design
  - B.S. - Entertainment Technology and Design
- **Mechanical Engineering**
  - B.S.E. – Mechanical Engineering
  - M.S.E. – Mechanical Engineering
  - M.S.A.E. – Aerospace Engineering
  - M.S.B.E. – Biomedical Engineering
  - M.S.M.N.E. – Materials and Nuclear Engineering
  - Ph.D. – Mechanical Engineering

The University of Nevada Las Vegas is accredited by the Northwest Commission on Colleges and Universities (NWCCU).

- The NWCCU has a 7-year accreditation process. The most recent accreditation evaluation was in 2017 and the university’s accreditation was reaffirmed in January 2018.
- The UNLV received its’ initial accreditation from the Northwest Association of Secondary and Higher Schools in 1958.

UNLV's International Programs are approved by the Council on International Educational Exchange. The following table lists accreditation agencies for other programs at UNLV.

<b>College</b>	<b>Program</b>	<b>Accredited by</b>
School of Integrated Health Sciences	Dietetic Internship	<a href="#"><u>ACEND</u></a>
	Athletic Training Program (B.S.)	<a href="#"><u>caATe</u></a>
	Doctor of Physical Therapy Program (DPT)	<a href="#"><u>CAPTE</u></a>
	Radiography, B.S.	<a href="#"><u>JRCERT</u></a>
	Health Physics - Environmental Option, M.S.	<a href="#"><u>ABET</u></a>
	Health Physics - Medical Physics, D.M.P.	<a href="#"><u>CAMPEP</u></a>
Lee Business School	Accounting – B.S. & M.S.	<a href="#"><u>AACSB</u></a>
	Economics – B.A., B.S., M.A.	<a href="#"><u>AACSB</u></a>
	Real Estate – B.S.B.A.	<a href="#"><u>AACSB</u></a>
	Finance – B.S.B.A.	<a href="#"><u>AACSB</u></a>
	Management, Entrepreneurship & Technology – B.S.B.A. Entrepreneurship or Management or Information Management Graduate Certificate in Management	<a href="#"><u>AACSB</u></a>

	Information Systems M.S. – Management Information Systems	
	Marketing & International Business – B.S.B.A. International Business or Marketing	<a href="#"><u>AACSB</u></a>
	E.M.B.A.- Executive Master of Business Administration	<a href="#"><u>AACSB</u></a>
	Graduate Certificate in Business Administration	<a href="#"><u>AACSB</u></a>
	Graduate Certificate in New Venture Management	<a href="#"><u>AACSB</u></a>
	M.B.A. - Master of Business Administration	<a href="#"><u>AACSB</u></a>
School of Public Health	Health Care Administration, B.S.	<a href="#"><u>AUPHA</u></a> <a href="#"><u>CEPH</u></a>
	M.H.A. (Master of Health Care Administration) and Executive M.H.A.	<a href="#"><u>CAMHE</u></a> <a href="#"><u>CEPH</u></a>
	Public Health - B.S., M.P.H., & Ph.D.	<a href="#"><u>CEPH</u></a>
School of Dental Medicine	Doctor of Dental Medicine (DMD)	<a href="#"><u>CODA</u></a>
	Doctor of Dental Surgery (DDS)	<a href="#"><u>CODA</u></a>

	Orthodontics & Dentofacial Orthopedics, Certificate	<a href="#"><u>CODA</u></a>
	Pediatric Dentistry, Certificate	<a href="#"><u>CODA</u></a>
General Practice Residency, Certificate	<a href="#"><u>CODA</u></a>	
College of Education	School Psychology	<a href="#"><u>NASP</u></a>
Howard R. Hughes College of Engineering	Construction Management, B.S.	<a href="#"><u>ACCE</u></a>
	Computer Science, B.S.	<a href="#"><u>Computing Accreditation Commission of ABET</u></a>
	Civil Engineering, B.S.	<a href="#"><u>Engineering Accreditation Commission of ABET</u></a>
	Computer Engineering, B.S.	<a href="#"><u>Engineering Accreditation Commission of ABET</u></a>
	Electrical Engineering, B.S.	<a href="#"><u>Engineering Accreditation Commission of</u></a>

		<a href="#"><u>ABET</u></a>
	Mechanical Engineering, B.S.	<a href="#"><u>Engineering Accreditation Commission of ABET</u></a>
College of Fine Arts	Landscape Architecture, B.L.A.	<a href="#"><u>LAAB</u></a>
	Architecture, M. Arch.	<a href="#"><u>NAAB</u></a>
	Interior Architecture & Design, B.S.	<a href="#"><u>CIDA</u></a>
	Art, B.A., Studio Art, Art History, or Secondary Education in Art	<a href="#"><u>NASAD</u></a>
	Art, B.F.A., Studio Art (Photography or Sculpture)	<a href="#"><u>NASAD</u></a>
	Art, B.S., Secondary Education in Art	<a href="#"><u>NASAD</u></a>
	Art, M.F.A, Studio Art (Photography or Sculpture)	<a href="#"><u>NASAD</u></a>
	Music, B.A.	<a href="#"><u>NASM</u></a>
	Music, B.M., Composition, Jazz Studies, Music Education, or Performance	<a href="#"><u>NASM</u></a>
	Music, M.M., Music Education, Performance, Conducting, or Composition	<a href="#"><u>NASM</u></a>



	Music, D.M.A., Applied Music	<a href="#"><u>NASM</u></a>
William F. Harrah College of Hotel Administration	Concentration in PGA Golf Management	<a href="#"><u>Professional Golfers' Association of America</u></a>
William S. Boyd School of Law	Juris Doctor, J.D.	<a href="#"><u>ABA</u></a>
College of Liberal Arts	Ph.D. Psychology, Clinical Track	<a href="#"><u>APA</u></a>
School of Medicine	M.D.	<a href="#"><u>LCME</u></a>
	Master of Couple and Family Therapy	<a href="#"><u>COAMFT</u></a>
School of Nursing	B.S.N.	<a href="#"><u>CCNE</u></a>
	M.S.N.	<a href="#"><u>CCNE</u></a>
	D.N.P.	<a href="#"><u>CCNE</u></a>
College of Urban Affairs	M.P.A.	<a href="#"><u>NASPAA</u></a>
	B.S.W.	<a href="#"><u>CSWE</u></a>
	M.S.W.	<a href="#"><u>CSWE</u></a>

1.1.1.2 The degree program is to be in operation for a sufficient time to have granted the degree for which accreditation is sought. Degree programs shall have at least one class of graduates. Describe the time of degree program operation and graduation rates by semester.

Dr. Hugh Burgess, Head of Architecture Studies, and later Dean of the College of Architecture, Construction and Planning, founded the Construction Management Program in 1987 under the

name of the Construction Administration Program. The Construction Administration Program was included in a group of programs under the Architecture Studies Unit within the Howard R. Hughes College of Engineering at UNLV. Professor Luther Strange, from the University of Florida, and Professor Neil Opfer, from Western Michigan University, joined the faculty in tenure-track positions as the first full-time Construction Management faculty members in August 1989. Shortly thereafter, Professor Opfer was appointed Program Coordinator, and the Program's name was changed to Construction Management (CM). In May 1990, CM had its first graduation class of three students.

UNLV's College of Architecture, Construction Management, and Planning was formed in fall 1994. As part of the June 1996 University Re-Organization Plan, its name was changed to the School of Architecture and moved to the College of Fine Arts. At the same time, the CM Program was relocated back to the Howard R. Hughes College of Engineering, becoming a subordinate unit of the Department of Civil and Environmental Engineering (CEE). The American Council for Construction Education (ACCE) granted the CEM Program accreditation in 1999. A CM graduate program was added that same year.

The CEM Program became a separate unit within the College of Engineering in July 2006. Between July 2006 and July 2011, Construction Management operated as an independent academic unit governed by a separate set of Bylaws with oversight from its own Industry Advisory Board.

Budgetary issues led the Board of Regents to require the CEM Program to remerge with the Department of Civil & Environmental Engineering in July 2011. The faculty and Industry Advisory Boards function as a single unit, addressing issues related to the Department's academic programs. The department name was changed to Civil & Environmental Engineering and Construction (CEEC) in 2012. The CEEC Department adopted new Bylaws in May 2013.

At the time of the merger, two CEM programs were offered –the Engineering Science Option and the Management Option. The faculty voted to close the Engineering Science Option to enrollment in 2012.

The CEEC Department currently has 18 full time tenured or tenure track faculty, organized into 5 major areas – Construction, Geotechnical, Structures, Transportation, and Water Resources/Environmental. The Construction area is comprised of four faculty – Dr. Pramen P. Shrestha (tenured Professor), Professor Neil Opfer (tenured Associate Professor), Dr. Jin Ouk Choi (tenure track Assistant Professor), and Jee Woong Park (tenure track Assistant Professor). The CEM Program also utilizes highly qualified local professionals as part-time instructors. The combination of academic rigor and industry expertise yields a strong Program that satisfies its Mission Statement:

*“To produce quality graduates with technical and managerial skills that meet or exceed the expectations of the construction industry.”*

As of Fall 2019, the CEM Program has 96 declared undergraduate CM majors. Many of these students are non-traditional and transfer students. Most of the students hold part-time or full-time positions in the local construction industry. Enrollment is gradually increasing after a steep decline due to the severity of the construction recession in Southern Nevada from 2008-2014.

<b>Enrollment</b>	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019
Construction Management Undergraduate	47	49	68	70	83	96

#### Degree Granted

<b>Degree Granted</b>	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
Construction Management Undergraduate	6	5	3	4	10

#### 1.1.1.3 Describe the major emphasis of the degree program.

The emphasis of CEM Program is to prepare students who can work in middle and upper management in the residential, commercial, and heavy/industrial construction industry sectors. CM graduates are working on a variety of projects within these sectors here in Nevada, the U.S. and around the world. Examples of projects worked on by graduates include residential housing developments, multi-family projects, office buildings, retail projects, distribution centers, resort hotels, water/wastewater treatment plants, roads and highways. Employers of CEM Graduates include ENR Top 400 Contractors, CM Firms, Subcontractors, Owner/Developers, and Governmental Agencies along with service firms to the industry such as suppliers, vendors, and construction insurance/surety bonding firms. The majority of graduates’ work in the residential and commercial construction sectors.

#### 1.1.1.4 Who is the designated administrator responsible for the leadership and management functions of the degree program (include title and rank).

Dr. Sajjad Ahmad is the administrator for this Program. He serves in this role as Chair of the Department. Dr. Ahmad has over 20 years of experience in the consulting and academic sectors. He holds a B.S. in Civil Engineering from University of Engineering and Technology, Lahore, Pakistan; an M.S. in Civil Engineering from Asian Institute of Technology, Bangkok, Thailand, and a Ph.D. in Civil Engineering from the University of Western Ontario, London, Canada. Dr. Ahmad is a registered Professional Engineer (P.E.). Dr. Ahmad’s title and rank are Chair and Professor.

## 2. GOVERNANCE AND ADMINISTRATION

### 2.1 Requirements

#### 2.1.1 INSTITUTIONAL ORGANIZATIONAL STRUCTURE

- 2.1.1.1 Describe the organizational structure of the educational institution. Be sure to provide a basis for establishing authority and responsibility, utilizing resources, and achieving the degree program's mission, goals, and objectives.

The UNLV administration is headed by the President who is responsible for the functioning of the university in accordance with the Nevada System of Higher Education Board of Regents Handbook and Procedures and Guidelines Manual. The President creates the administrative structure that best fits the mission of the institution. The President reports to the Chancellor, and through the Chancellor to the Board of Regents. In accordance with the NSHE Board of Regents Handbook, UNLV Bylaws, the university has an elected representative Faculty Senate. The authority, purpose, and objectives of the Faculty Senate are defined in its Bylaws. Per Senate Bylaws, the Senate represents faculty members who hold at least a fifty-percent professional contract. The Faculty Senate meets monthly during the academic year in open meetings to which all faculty and staff are invited.

The President, to whom the following report:

- Executive Vice President and Provost
- Senior Vice President for Finance and Business
- Vice President for University Compliance
- Chief Marketing Officer & Vice President of Brand Integration
- Chief of Staff
- Senior Advisor to the President
- Executive Director, Strategy and Strategic Initiatives
- Special Assistant to the President
- Vice President of Philanthropy & Alumni Engagement
- General Counsel
- Director of Intercollegiate Athletics

The Executive Vice President and Provost (EVPP) has the following positions as direct reports as well as the Deans who head the eighteen colleges:

- Vice Provost Academic Programs
- Vice Provost Decision Support
- Vice Provost Educational Outreach
- Vice Provost Faculty Affairs
- Vice Provost Undergraduate Education
- Vice Provost for Information Technology
- Vice President for Research and Economic Development
- Vice President for Student Affairs

- Assistant Vice President Academic Resources
- Chief Diversity Officer
- Director of Communications
- Chief of Staff
- Executive Assistant to the EVPP

The Howard R. Hughes College of Engineering is one of the eighteen colleges that report to the Executive Vice President and Provost.

Figure 1a illustrates the administrative organization of the University of Nevada, Las Vegas under the office of President. All academic programs, including Construction Management (CEM), report to the Executive Vice President and Provost, Dr. Chris Heavey, through their respective Dean. Figure 1b shows the offices of the Executive Vice President and Provost (EVPP). The CEM Program is housed within the Department of Civil & Environmental Engineering and Construction, which is part of the Howard R. Hughes College of Engineering. Figure 1c shows the organization of the Howard R. Hughes College of Engineering.

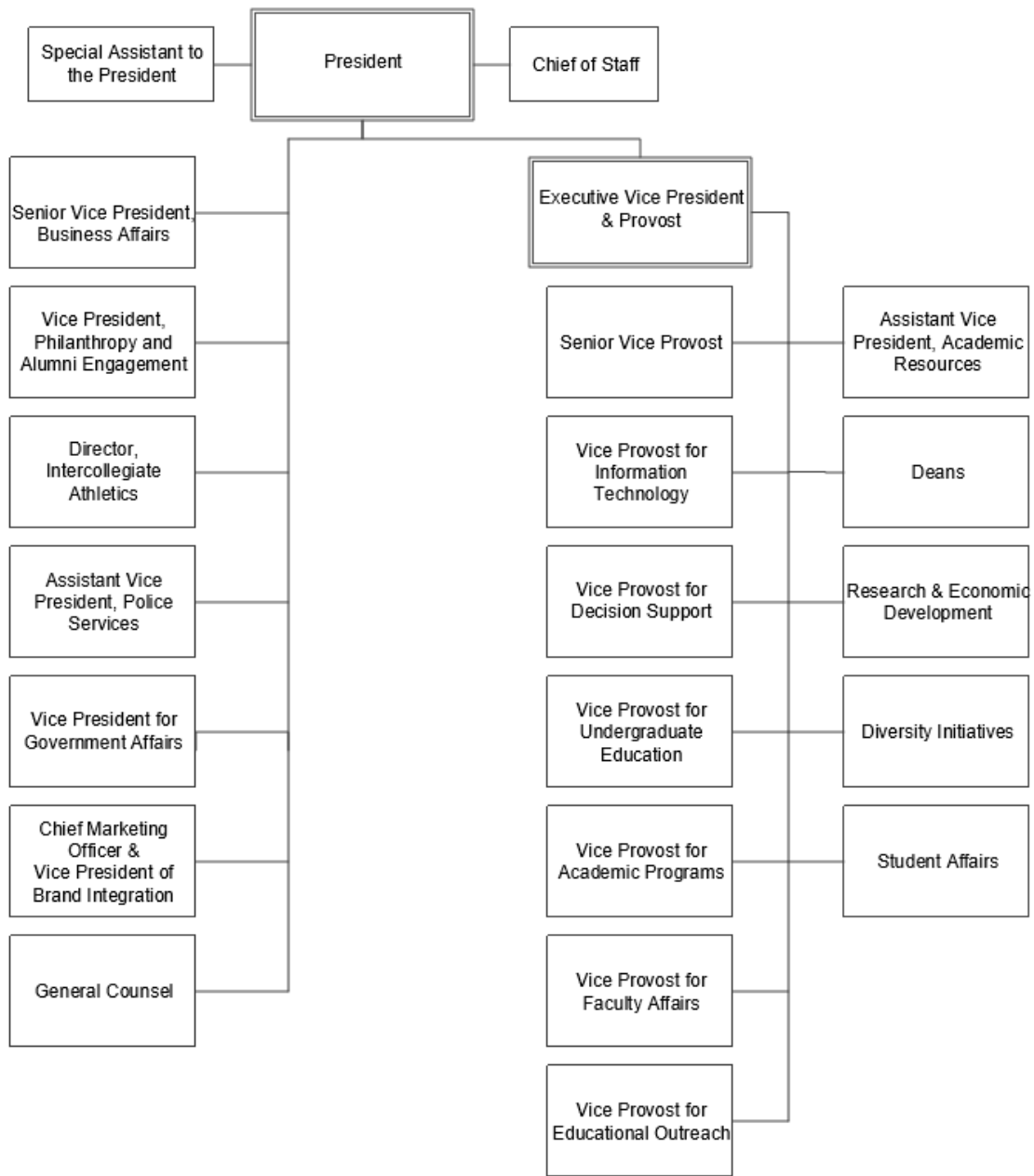
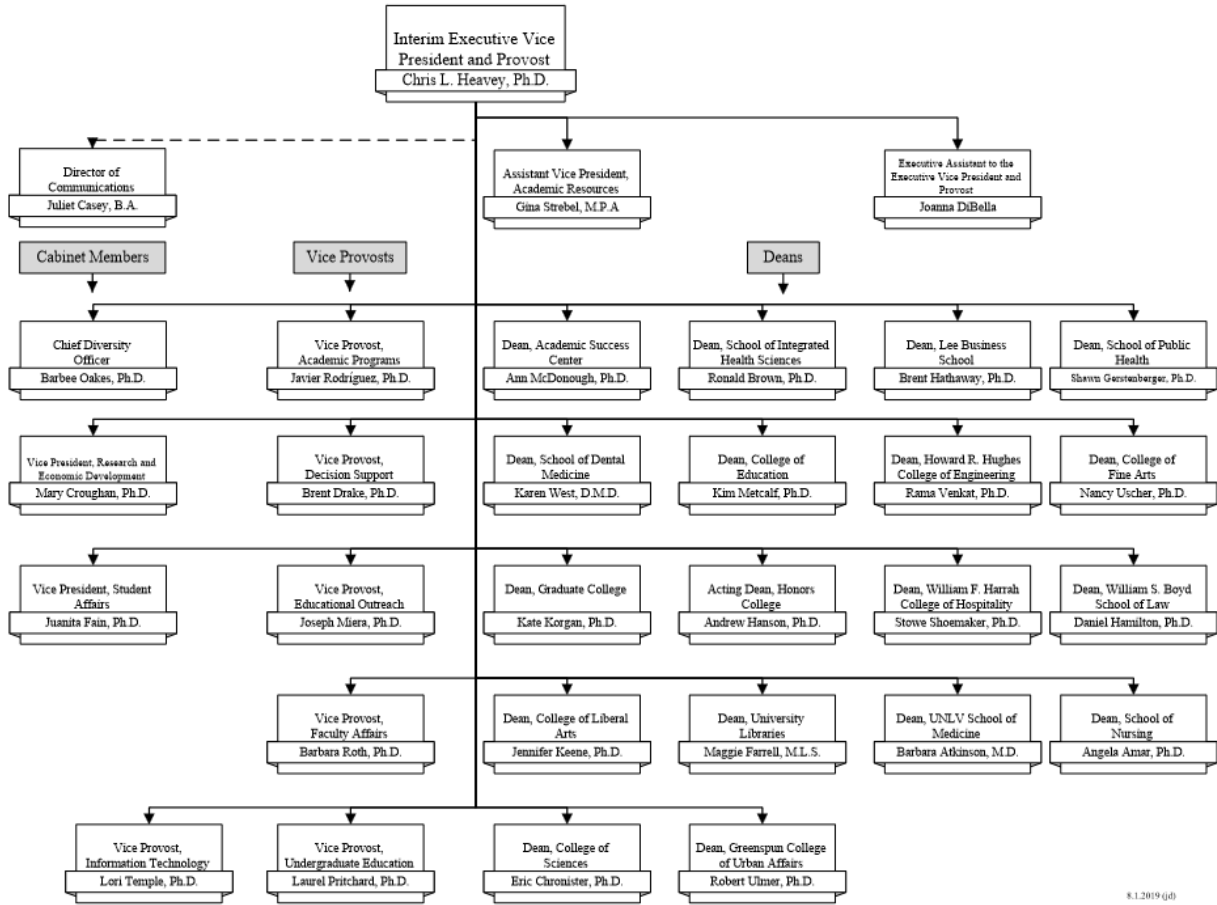


Fig 1a Organization Chart of office of President



8.1.2019 (j.d)

Fig 1b: Organization Chart of office of Executive Vice President and Provost

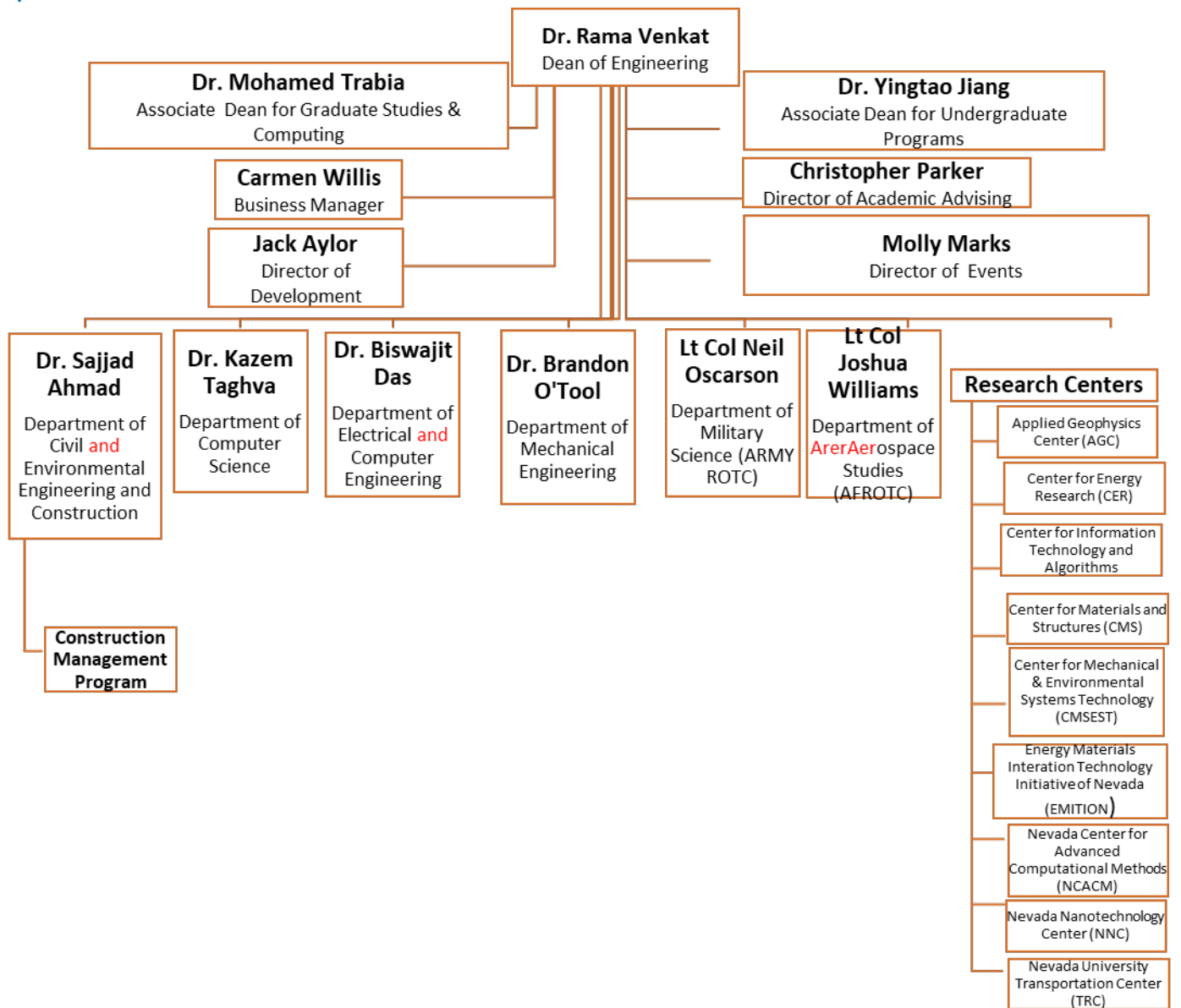


Fig 1c: Organization Chart of Dean College of Engineering



The hierarchy of positions related to the CEM Program is presented below, in ascending order.

**Name of incumbent:** Sajjad Ahmad, Ph.D., PE  
**Title:** Professor and Chair, Civil and Environmental Engineering and Construction

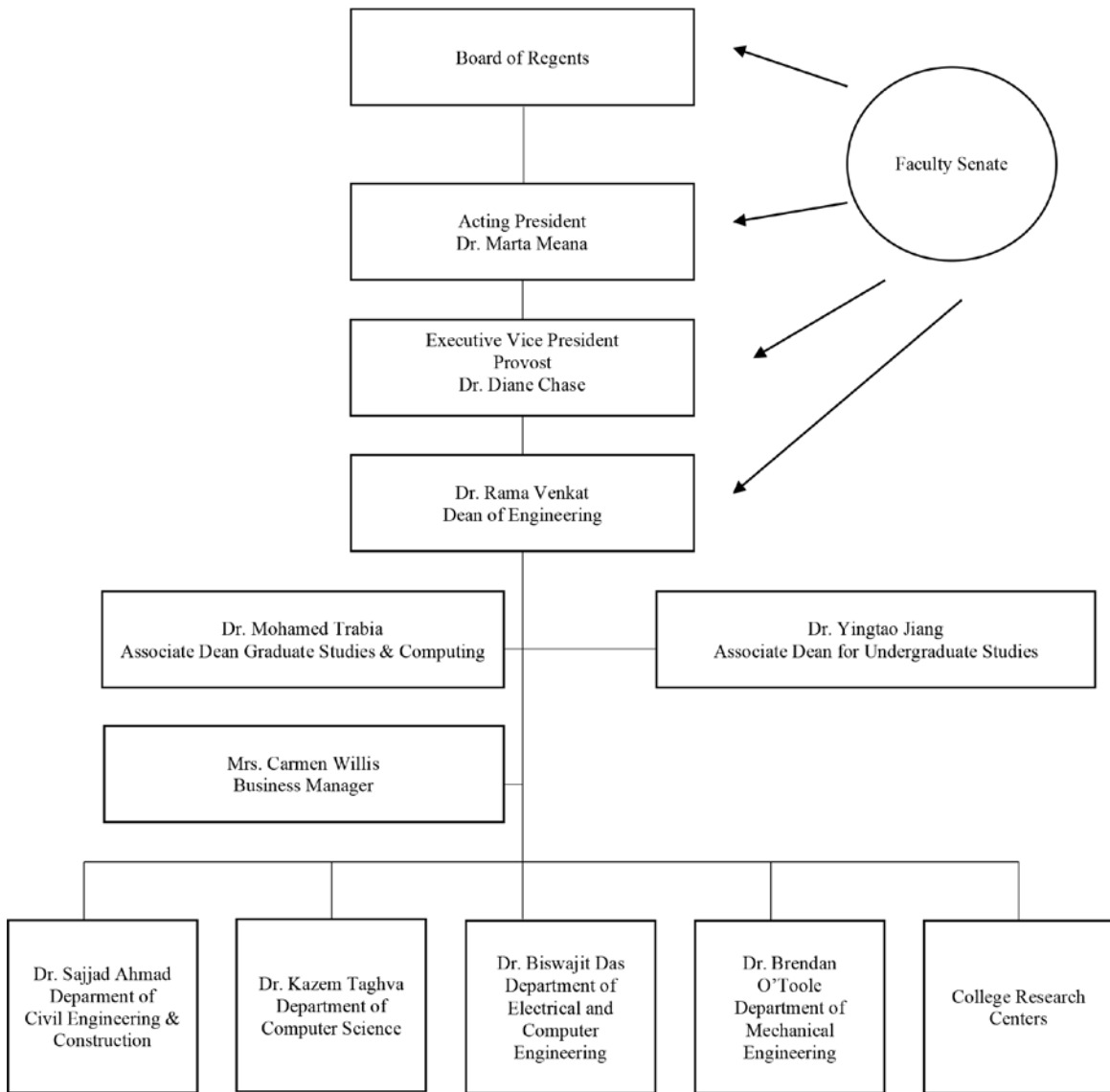
**Name of Incumbent:** Rama Venkat, Ph.D.  
**Title:** Dean, Howard R. Hughes College of Engineering

**Name of Incumbent:** Chris Heavey, Ph.D.  
**Title:** Interim Provost, University of Nevada Las Vegas

**Name of Incumbent:** Marta Meana, Ph.D.  
**Title:** Acting President, University of Nevada Las Vegas

- 2.1.1.2 Describe the degree program and its relationship to the overall organizational structure of the institution. Note how this documented, defined, and publicly made accessible.

Five departments are located in the Howard R. Hughes College of Engineering. Each department is headed by a department chair, who reports to the Dean of the College of Engineering. The Dean of the College of Engineering reports to the Provost and President, as shown in the organization charts below (Fig 1d). This is the common structure for departments at UNLV.



**Figure 1d Organizational Chart as it related to the Program**

## 2.1.2 EDUCATIONAL UNIT AUTONOMY, STRUCTURE AND LEADERSHIP

### 2.1.2.1 Describe how the educational unit is distinct and an identifiable entity within the educational institution.

Construction Management (CEM) program is a part of Department of Civil and Environmental Engineering and Construction (CEEC). CEEC is one of the five Departments in the College of Engineering. College of Engineering [website](#) has links to all Departments including CEEC. CEEC website provides links to two undergraduate degree programs i.e., Civil Engineering and Construction Management.

### 2.1.2.2 Describe the qualifications of the administrator that heads the degree program or educational unit.

Dr. Sajjad Ahmad is the administrator for this Program. He serves in this role as Chair of the Department. Dr. Ahmad has over 20 years of experience in both consulting and academia. He holds a B.S. in Civil Engineering from University of Engineering and Technology, Lahore, Pakistan; a M.S. in Civil Engineering from Asian Institute of Technology, Bangkok, Thailand, and a Ph.D. in Civil Engineering from the University of Western Ontario, London, Canada. Dr. Ahmad is a registered Professional Engineer (P.E.). Dr. Ahmad's title and rank are Chair and Professor. Dr. Ahmad is a recipient of NSF CAREER award and an accomplished educator and researcher. He has published more than 100 papers in peer-reviewed Journals (> 5600 citations, h-index 46; i10-index 85). He serves on the editorial board of 5 journals and has served or serving as chair of ASCE-EWRI committees (Emerging and Innovative Technologies; International Council, Visiting International Fellowship).

### 2.1.2.3 Explain how the organizational structure of the educational unit is designed to encourage communication, coordination, and interaction between administrative officers, faculty, and students involved with the degree program, other disciplines, and other educational institutions.

The Department Chair regularly meets, including one-on-one meetings, with the Dean. There are two monthly Executive Committee Meetings with the Dean which include all Department Chairs. Faculty are also represented at the College level on the College Committees. The staff are also represented at the College level on the Staff Council.

The Department holds Department Meetings once a month. Other meetings are scheduled as required between faculty, staff, and students. The Department Chair meets with all juniors in the spring of each year. Additionally, the Department Chair meets with the seniors in the spring of each year to conduct an exit interview. During these sessions, we seek to assess student satisfaction by soliciting suggested improvements and discussing issues related to the CM program.

- 2.1.2.4 Describe how the educational unit and leadership structure is defined and publicly accessible

Leadership structure is publically accessible through College of Engineering website <https://www.unlv.edu/engineering>.

### 2.1.3 FACULTY PARTICIPATION

- 2.1.3.1 Explain how the faculty participates in the educational unit's governance and administration in accordance with the educational institution's guidelines.

The department chair is the main coordinator of the program based on input from faculty. Curriculum, new hires, major initiatives, and key faculty assignments, are all based on a faculty vote. Elected through faculty vote, undergraduate and graduate coordinators assist the Department Chair in leading the Department. Merit, Promotion, and Tenure procedures follow the faculty Department, College and UNLV Bylaws. Faculty committees from the CEEC Department provide input on matters related to recruitment, tenure, and promotion.

- 2.1.3.2 Explain how the faculty participate in degree program maintenance and administration in accordance with the educational institution's guidelines.

As a part of the Department's Quality Improvement Plan, the faculty annually conduct a day long off site retreat. During this retreat, faculty review the collected data (individual course assessment, AIC exam results, exit interview results, alumni and employer survey results) to determine curriculum and operational improvements that should be undertaken. A subcommittee of the Department's Industrial Advisory Board is responsible for reviewing curriculum and helping to identify contemporary topics that need to be introduced to undergraduate and graduate students. If a curriculum change is deemed necessary, after it is approved by department faculty, it is reviewed and approved by both college curriculum committee and university curriculum committees. University curriculum committee can be Faculty Senate committee for undergraduate changes and Graduate College Programs Committee or Curriculum Committee, depending on what type of changes are being requested.

### 2.1.4 CONTRIBUTION TO THE INSTITUTION

- 2.1.4.1 Detail how the educational unit and degree program contributes to the mission of the institution

The Institution's Mission Statement is as follows. "UNLV's diverse faculty, students, staff, and alumni promote community well-being and individual achievement through education, research, scholarship, creative activities, and clinical services. We stimulate economic development and diversification, foster a climate of innovation, promote health, and enrich the cultural vitality of the communities that we serve."

The CEEC Department and the Construction Management Program contribute to UNLV's Mission through:

**UNLV Core theme 1: Student Achievement**

- Achievement of student learning outcomes using a continuous quality improvement program (accredited programs)
- Placement of graduates into internships and employment opportunities (all graduate in past 2 years 2018 and 2019 had internships and offer of employment at graduation).
- Providing opportunities to students to participate in competitions (first position in design build competition in 2018 and 2019 at ASC, Reno).

**UNLV Core theme 2: Research, Scholarship, and Creative Activity**

- Impact of our research and scholarship (publications in peers reviewed journals and presentations at national and international conferences.
- Intellectual activity, patents, and entrepreneurial activity.

**UNLV Core theme 4: Community Partnership**

- A deeper engagement with the Las Vegas Community:
- Activities with schools, technical academies, and construction industry. For example, hosting 1000+ high school students and industry representatives on UNLV campus annually during Construction Career Day in October.
- Free public lectures
- OSHA training programs
- Service learning opportunities for students

Department encourages and supports student, faculty, and staff diversity, contributing to UNLV's Minority Serving Institution (MSI) status and Hispanic Serving Institution (HSI) status.

### **3. CURRICULUM**

#### **3.1 Requirements**

##### **3.1.1 DEGREE PROGRAMS**

- 3.1.1.1 Compare the teaching philosophy and purpose of the degree program with the teaching philosophy and purpose of the educational unit and the institution.

The mission of the CEEC Department is to produce competent, ethical, and socially-responsible graduates, develop and advance knowledge, and serve the community and the profession. The goals of the Department's accredited baccalaureate programs are to:

- Prepare graduates for the lifelong professional practice in the diverse fields of Civil Engineering and Construction Management.
- Prepare graduates for professional licensure.
- Provide graduates with solid academic preparation for graduate study.

The Objectives of Construction Management Program are:

- Graduates will meet the expectations of employers of construction managers in all areas of construction practice
- Graduates will be capable of advancement in the construction profession
- Qualified graduates will be capable of pursuing advanced study

The teaching aspect is central to the aforementioned University's Mission "UNLV's diverse faculty, students, staff, and alumni promote community well-being and individual achievement through education, research, scholarship, creative activities, and clinical services. We stimulate economic development and diversification, foster a climate of innovation, promote health, and enrich the cultural vitality of the communities that we serve."

The Construction Management Program enhances student achievements and learning by incorporating active learning, internships, extracurricular activities related to construction, and having active researchers as faculty.

- 3.1.1.2 Describe how the degree program curriculum is related to the needs of society and the construction profession.

With input from all stakeholders (industrial advisory board, students, alumni, employers and faculty) the curriculum is periodically reviewed to make sure it meets the evolving needs of construction profession and society. Each individual course's content is revised based on the changing demands of the construction industry. The instructor of the course is responsible for changing the course content, so that it meets the industry's requirements. These course-

content changes are discussed in Faculty Meetings with the feedback from the Industrial Advisory Board and the Faculty votes to change the course contents.

- 3.1.1.3 List the semester hours required for the degree:  
Semester hours 123-125 or quarter hours \_\_\_\_\_

### **3.1.2 GENERAL EDUCATION**

- 3.1.2.1 Communications: List the courses and course descriptions along with corresponding semester or quarter hours associated with Communication Core Subject Area (note the courses that are taught external to the degree program).

#### **COM 101 - Oral Communication**

Theory and performance work in extemporaneous speaking and related speaking experiences. Emphasis placed on developing skills necessary for effective public speaking.

Prerequisites: None

Credits (3SH); External to the degree program.

#### **ENG 101 - Composition I**

Evidence-based, writing intensive course designed to improve critical thinking, reading, and writing proficiencies through guidance in writing the thesis-driven essay. Students develop strategies for turning their experience, observations, and analyses into evidence suitable for academic writing. Emphasis on writing the short, focused, concretely developed college paper.

Prerequisites 500 SAT Critical Reading, or 18 ACT English, or 9 ENGPLACE, or ENG 98, or ERWS 480.

Credits (3SH); External to the degree program.

#### **ENG 102 - Composition II**

Builds on the critical thinking, reading, and writing skills developed in ENG 101. Students learn the processes necessary for collecting and incorporating research material into their writing. They learn to cite and document research sources and how to develop arguments and support them with sound evidence.

Prerequisite: ENG 101, ENG 101F, or equivalent.

Credits (3SH); External to the degree program.

3.1.2.2 Mathematics: List the courses and course descriptions along with corresponding semester or quarter hours associated with Mathematics Core Subject Area (note the courses that are taught external to the degree program).

### **MATH 181 - Calculus I**

Differentiation and integration of algebraic and transcendental functions, with applications.

Prerequisite: MAT 128 or equivalent.

Credits (4SH); External to the degree program.

### **STAT 152 - Introduction to Statistics**

Basic statistical methods, with emphasis on application, descriptive statistics, graphic presentation, point and interval estimation, hypothesis testing, regression, experimental design.

Prerequisite: MATH 126 or equivalent.

Credits (3SH); External to the degree program.

3.1.2.3 Physical Science: List the courses and course descriptions along with corresponding semester or quarter hours associated with the Physical Science Core Subject Area (note the courses that are taught external to the degree program).

### **PHY 151/151L – 152/152L- General Physics I**

General physics intended primarily for students in liberal arts, medicine, and the biology sciences. Lecture and laboratory exercises in mechanics, heat, electricity, magnetism, optics, and modern physics.

Prerequisites: MAT 128 or equivalent, or placement test.

Lab/Lecture/Studio Hours Three hours lecture and three hours laboratory.

Credits (4SH); External to the degree program.

### **PHY 152/152L- General Physics II**

General physics intended primarily for students in liberal arts, medicine, and the biological sciences. Lecture and laboratory exercises in mechanics, heat, electricity, magnetism, optics, and modern physics.



Prerequisites MATH 128 or equivalent, or placement test. PHYS 151 / PHYS 151L is prerequisite for PHYS 152/ PHYS 152L.

Lab/Lecture/Studio Hours Three hours lecture and three hours laboratory.

Credits (4SH); External to the degree program.

### **3.1.3 BUSINESS AND MANAGEMENT**

3.1.3.1 List the courses and course descriptions along with corresponding semester or quarter hours that are fundamental to the Core Subject Matter of Business and Management. These courses are intended as foundational knowledge for construction business practices (note the ones that are taught external to the degree program):

#### **ACC 201 - Financial Accounting**

Overview of the annual report with emphasis on financial statements. Analysis of business transactions and their effects on external financial statements. Theories, practices, and concepts underlying accounting information used in the decision-making process.

Prerequisites: Sophomore standing.

Credits (3SH); External to the degree program.

#### **ECON 102 - Principles of Microeconomics**

Introduction to economic organization of society with emphasis on how markets and prices guide and direct economic activity. Economic analysis applied to a wide range of contemporary issues.

Prerequisite: MATH 124 or higher with a minimum C grade.

Credits (3SH); External to the degree program.

#### **ECON 190 - Global Economics**

Introduction to the economic organization of global markets. Analysis of international trade and finance, transnational corporations, global economic institutions, economic growth and economic systems.

Prerequisite: None

Credits (3SH); External to the degree program.

#### **MGT 301 - Principles of Management and Organizational Behavior**

Fundamentals and principles of management. Administrative policies, objectives, and procedures. Problems of organization control and leadership.

Prerequisites: Admission to a business major/junior standing.  
Credits (3SH); External to the degree program.

### **BLW 302 - Legal Environment**

Nature and function of law; legal system; constitutional law; administrative law; antitrust; consumer protection; torts; product liability.

Prerequisites Admission to a business major/junior standing\*.  
Credits (3SH); External to the degree program.

### **CEE 307 - Engineering Economics**

Engineering economic analysis for the evaluation of technical alternatives and necessary economic trade-offs made in planning, designing, and operating engineering systems.

Prerequisites: Completion of 30 credits (Sophomore standing) and MATH 181 with a grade of C or better.  
Credits (3SH)

3.1.3.2 Explain how these topics are taught as separate and distinct from the topics contained in the construction business and management courses.

CEM Faculty are cognizant of the course material covered in the Business and Management Core. ECON 102 - Principles of Microeconomics and ECON 190 - Global Economics are taught external to the program and cover more fundamental aspects of economics. CEE 307 Engineering Economics, which focuses on engineering applications is taught within the CEEC Department. Other classes such as ACC 201 Financial Accounting and BLW 302 Legal and Ethical Environment of Business set the foundational knowledge required for CEM Students as they take CEM 452 Construction Cost Control and CEM 485 Construction Law and Contracts. The construction classes may use similar concepts from some of the business coursework but focus on construction concepts. Therefore, in CEM 452 a balance sheet may be analyzed as to qualifications for a contractor's surety bond based upon working capital. CEM 452 deals with concepts such as change orders and insurance from a construction perspective such as commercial general liability insurance to protect contractors from construction defect issues. Similarly, a class such as CEM 485 may focus on breach of a contract but it applies to a construction project contract issue such as a failure to meet a CPM schedule along with relevant AIA, EJCDC, or Consensus Docs contract language and interpretation. Textbooks utilized as foundational teaching materials for these construction courses are all construction textbooks with no utilization of business textbooks to avoid material duplication aspects. Construction claims in CEM 485 focus on those unique aspects of construction projects that generate claims such as contract performance issues, differing site conditions, construction schedule/delay claims, and incomplete plans/specifications. Overarching all of this are experienced construction faculty both those as PTI Faculty coming from the construction industry as well as the Full-Time Faculty with their backgrounds from both the construction industry and top construction academic programs.

### 3.1.4 CONSTRUCTION

*Table 3.1.1 Summary of Category Semester (Quarter) Hour Requirement Bachelor Degree:*

Curriculum Categories		Bachelor Degree		Program
		SH*	QH**	Indicate SH or QH SH-----
3.1.2.1	Communications	6	9	<b>9 SH</b>
3.1.2.2	Mathematics Algebra, trigonometry, analytic geometry, pre-calculus, OR statistics.	3	4	<b>7 SH</b>
3.1.2.3	Physical Science Analytical physical science	6	9	<b>8 SH</b>
3.1.3	Business & Management Accounting, Economics, Business law OR Principles of Management.	12	18	<b>18 SH</b>
<b>Total Combined 3.1.2.1, 3.1.2.2, 3.1.2.3, and 3.1.3***</b>		33	48	<b>42 SH</b>
<b>Total of above external to the program</b>		33	48	<b>42 SH</b>
3.1.4	Construction	50	75	<b>58 SH</b>
<b>Subtotal</b>		83	123	<b>99 SH</b>
Other Credits****		37	57	<b>23 SH</b>
<b>Total ACCE Accreditation Requirements</b>		120	180	<b>123 SH</b>

\* Semester Hour

\*\* Quarter Hour

\*\*\* The total shown for 3.1.2.1, 3.1.2.2, 3.1.2.3, and 3.1.3 is 27 semester hours for bachelor's degree. These semester hours fulfill a portion of the Total Combined required minimum of 18 semester hours for bachelor's degree. Six additional semester hours are therefore necessary to meet the Total Combined hours for bachelor's degree and may come from any combination of courses within these core areas. All 33 semester hours for bachelor's degree programs generated within these core areas shall be taught outside the degree program to enhance the interdisciplinary nature.

\*\*\*\* These minimum semester (quarter) hours shall be used by the degree programs in any way it desires to meet ACCE Student Learning Outcomes, degree program-specific focus or specialization, and other institutional requirements.

List all other courses along with course descriptions:

**FIRST-YEAR SEMINAR (Typically EGG 101) – 2 credit hours (semester)**

**EGG 101 - Introduction to Engineering Experience**

Seminar: Introduction to UNLV learning outcomes and the programs that reside within the College of Engineering. Topics include professional ethics, technical communication, the design process, and technology's impact on a global society.

Credits (2SH)

**SECOND-YEAR SEMINAR (Typically PHIL 242)**

**PHIL 242 - Ethics for Engineers and Scientists**

Ethical issues (e.g., whistle blowing, the environment) that commonly arise in engineering and science practice. Ethical theory, followed by case-study centered discussions designed to hone students' abilities to recognize and articulate ethical problems and to utilize institutional supports for ethical behavior that already exist in the professional environment.

Credits (3SH)

**Constitution – 4 TO 6 credit hours (semester)**

Instruction must be given in the essentials of the Constitution of the United States and the Constitution of the State of Nevada, including the origin and history of the Constitutions and the study of and devotion to American institutions and ideals pursuant to Nevada Revised Statutes 396.500 for all associate and baccalaureate degrees. There are multiple options students can take to complete the US and Nevada Constitution requirement which include the following: PSC 101, HIST 100, HIST 101+102, or HIST 101 + (HIST 217 or PSC 100)

**Humanities – 6 credit hours (semester)**

PHIL 242 or PHIL 249 is required and double dips with Second- Year Seminar  
The last three credits of humanities are covered by COM 101.

**Fine Arts – 3 credit hours (semester)**

**Options for students to take:** AAE 100; AAI 100; ART 101, 107, 211, 212, 135, 160, 216, 260, 261; CFA 103; DAN 100, 101, 103, 104, 166/AAS 166; FIS 100, 110; MUS 101, 121, 125, 127, 129, 134; LAND 100; THTR 100, 105, 124, 175.

**Social Science - 3 credit hours (semester)**

**PSY 101 or SOC 101 (required by department)**

**PSY101 - General Psychology**

Introduction to psychology including introductory treatment of sensation-perception-cognition, physiological psychology, learning, personality, development, social psychology, assessment, and history.

Credits (3SH)

**SOC 101 - Introduction to Sociology**

Introduction to understanding human behavior, social life, and social change through the perspective of sociology.

Credits (3SH)

**Multicultural and International Requirement**

The International requirement double dips with - ECON 190 - Global Economics.

The Multicultural requirement double dips with - BLW 302 Legal Environment of Business

**CEE 121 - Elementary Surveying**

Vertical and horizontal control methods: topographic and construction surveys, use of land survey equipment, note taking and graphical communication. Applications to earthwork and highway alignment.

Credits 2

Prerequisites Math 217 or 128.

Lab/Lecture/Studio Hours Two hours lecture plus three hours laboratory.

**CEE 301 CAD Tools for Civil Engineering Design**

Introduction to CAD-based civil engineering design tools, including COGO, surveying, roadway and site layout, digital terrain modeling, and earthworks design software.

Credits 2

Prerequisites CEE 121, and advanced standing.

**Construction Management Courses (58 credits)**

<b>Course No.</b>	<b>Course Title or Elective Requirements</b>	<b>Credit Hours</b>
CEM 100	Fundamentals of Construction Management	3
CEM 250/L	Construction Materials and Methods	4
CEM 253/L	Quantity Surveying and Document Analysis	3
CEM 270	Construction Engineering Mechanics	3
CEM 301	Construction Safety	2
CEM 330	Soils and Foundations for Construction	3
CEM 350	Facility Systems Design and Construction I	3
CEM 351	Facility Systems Design and Construction II	3
CEM 370	Steel and Wood Design in Construction	3
CEM 372	Concrete Design in Construction	3
CEM 432	Temporary Construction Structures	3
CEM 450	Construction Field Inspection	3
CEM 451/L	Construction Estimating	4
CEM 452	Construction Cost Control	3
CEM 453/L	Construction Scheduling.	3
CEM 454	Construction Equipment	3
CEM 455	Construction Management Practice	3
CEM 480	Sustainable Construction	3
CEM 485	Construction Law and Contracts	3

**CEM 100 - Fundamentals of Construction Management**

Overview of construction industry roles, responsibilities, and risks from perspectives of owners, constructors, designers, financial institutions, and governmental agencies. Study of construction process techniques and applications. Prerequisites: None. 3 credits.

### **CEM 250/L - Construction Materials and Methods**

Construction materials and components; materials specifications, descriptions, and usage; construction techniques, and optimal economic selection. Sustainable construction aspects considered. Three hours lectures and three hours' laboratory. Prerequisite: PHYS 151/PHYS 151L or PHYS 180/PHYS 180L. 4 credits.

### **CEM 253/L - Quantity Surveying and Document Analysis**

Quantity take off and comprehension, understanding, and critical analysis of documents from engineers, architects, other design professionals, governmental agencies, vendors, suppliers, and other contractors. Two hours lecture and three hours laboratory. Prerequisite: CEM 100 and CEM 250. 3 credits.

### **CEM 270 - Construction Engineering Mechanics**

Basic principles of engineering mechanics for constructors. Vectors, static analysis, stress, strain, Mohr's circle, beams, columns and trusses are covered. Computer applications. Prerequisites: CEM 250/L, MATH 181, PHYS 1511 OR PHYS 180/PHYS 180L. 3 Credits.

### **CEM 301 - Construction Safety**

Field of construction safety covering OSHA safety, health and environmental challenges for owners, contractors, subcontractors, and construction workers. Covers zero-injury techniques. Prerequisite: CEM 100, CEM 250, CEM 270. Advanced Standing required. 2 credits.

### **CEM 330 - Soils and Foundations for Construction**

Introduction to basic concepts of soils and foundations including compaction, compressibility, settlement, shear strength, and site investigations. Problem soils and solutions. Types and systems of foundations, bearing capacity, sheeting, and braced excavations. Prerequisites: CEM 270 or CEE 370 or ME 302, CEM 250/CEM 250L. Advanced Standing required. 3 credits.

### **CEM 350 - Facilities Systems Design and Construction I**



Introduction to mechanical systems for facilities including heating, air-conditioning, air handling, fire protection, piping and plumbing systems. Sustainable/green construction concepts. Energy conservation. Detailed knowledge to analyze needs, scope, design and construction of these systems as well as address design-construction integration issues. Prerequisites: CEM 250, PHYS 152/PHYS 152L or PHYS 182/PHYS 182L. Advanced Standing required. 3 credits.

### **CEM 351 - Facilities Systems Design and Construction II**

Introduction to electrical systems for facilities including power systems, wiring, safety, illumination, and lighting systems. Sustainable/green construction concepts. Energy conservation. Detailed knowledge to analyze needs, scope, design and construction of these systems as well as address design-construction integration issues. Prerequisite: CEM 250, PHYS 152/PHYS 152L or PHYS 182/PHYS 182L. Advanced Standing required. 3 credits.

### **CEM 370 - Steel and Wood Design in Construction**

Analysis and design of simple steel, timber, and wood structures using AISC, AF&PA, ICC, APA, AITC and ASCE 7. Computer applications. Prerequisite: CEM 270. Advanced Standing required. 3 credits.

### **CEM 372 - Concrete Design in Construction**

Analysis and design of simple concrete structures using ACI 318 and ASCE 7. Computer applications. Advanced Standing required. Prerequisite: CEM 270. 3 credits.

### **CEM 432 - Temporary Construction Structures**

Temporary Construction Structures Analysis, design, and construction of temporary structures including formwork, falsework, shoring, rigging, and access units. Cost analysis. Computer analysis applications. Safety consideration. Prerequisites: CEM 330 or CEE 334, CEM 370 or CEE 381, CEM 372 or CEE 480. Advanced Standing required. 3 credits.

### **CEM 450 – Construction Field Inspection**

Construction field inspection at project sites and vendor surveillance. Construction codes including IBC/IRC, IPC, IMC, and NEC. Standards including ACI, AISC, ANSI, ASTM, and AWS. Inspection

techniques and records. Quality assurance/ quality control concepts/development, techniques, analysis, enforcement and documentation. Prerequisites: CEM 330 or CEE 334, CEM 370 or CEE 381. Advanced Standing required. 3 credits.

### **CEM 451/451L - Construction Estimating**

Principles and procedures used in estimating construction costs. Application of quantity determination, estimate pricing, specifications, subcontractor and supplier solicitation, risk assessment and risk analysis, and final bidding preparation. Computer-based estimating used for semester project. Three hours lecture and three hours laboratory. Corequisite: CEM 454. Prerequisites: CEM 253, CEE 307. Advanced Standing required. 4 credits.

### **CEM 452/CEM 452L - Construction Cost Control**

Construction cost management including productivity and cost reporting/analysis concepts. Financial/cost issues/cash flow for the construction firm including reporting methods with percentage of completion techniques. Performance/profitability enhancement. Earned value management. Construction bonding and insurance issues. Firm and jobsite analysis. Case studies. Two hours lecture and three hours laboratory. Prerequisites: CEE 307, ACC 201. Advanced Standing required. 3 credits.

### **CEM 453/ CEM 453L - Construction Scheduling**

Scheduling and resource optimization. Includes short-interval schedules, Gantt charts, linear and matrix scheduling formats. Network techniques CPM and PERT concepts and calculations. Computer applications. Two hours lecture and three hours laboratory. Corequisites: CEM 451/451L. Prerequisite: Advanced Standing required. 3 credits.

### **CEM 454 - Heavy Construction Methods and Equipment**

Characteristics, capabilities, limitations, and uses and selection techniques for heavy construction methods and equipment. Process planning, simulation, fleet operations, and maintenance programs. Field trip(s) where appropriate. Prerequisite: CEM 330 or CEE 334 and CEE 307. Advanced Standing required. 3 credits.

### **CEM 455 - Construction Management Practice**

Direction and operation of construction organizations with examination of general contracting, design-build, and construction management methods. Synthesis of project management concepts,

applications, and limitations through case studies and semester project. Prerequisites: CEM 451/451L, CEM 452/452L, CEM 453/453L. Advanced Standing required. 3 credits.

### **CEM 480 - Sustainable Construction**

Overview of sustainable design and construction. Introduction to green buildings, LEED assessment process, high-performance building, and green building material. Economic analysis of green buildings. Prerequisite: Laboratory science course, consent of instructor. 3 credits.

### **CEM 485 - Construction Law and Contracts**

Legal problems in the construction process. Stipulated sum, unit price, and cost-plus contracts. Construction lien rights and bond rights. Scope of work issues. Builders risk issues. Risk-shifting. Case studies. Prerequisites: CEM 453/453L. Advanced Standing required. 3 credits.

### **3.1.5 STUDENT LEARNING OUTCOMES**

Section 3.1.5 is for reference, listing the Student Learning Outcomes. No specific response is needed here.

SLO 1- Create written communications appropriate to the construction discipline.

SLO 2- Create oral presentations appropriate to the construction discipline.

SLO 3- Create a construction project safety plan.

SLO 4- Create construction project cost estimates.

SLO 5- Create construction project schedules.

SLO 6- Analyze professional decisions based on ethical principles.

SLO 7- Analyze construction documents for planning and management of construction processes.

SLO 8- Analyze methods, materials, and equipment used to construct projects.

SLO 9- Apply construction management skills as an effective member of a multi-disciplinary team.

SLO 10- Apply electronic-based technology to manage the construction process.

SLO 11- Apply basic surveying techniques for construction layout and control.

SLO 12- Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.

SLO 13- Understand construction risk management.

SLO 14- Understand construction accounting and cost control.

SLO 15- Understand construction quality assurance and control.

SLO 16- Understand construction project control processes.

SLO 17- Understand the legal implications of contract, common, and regulatory law to manage a construction project.

SLO 18- Understand the basic principles of sustainable construction.

SLO 19- Understand the basic principles of structural behavior.

SLO 20- Understand the basic principles of mechanical, electrical and plumbing systems.

### **3.1.6** Determination of Achievement of Student Learning Outcomes

- 3.1.6.1 Provide an index, cross-tab, curriculum map, or other form of summary clearly relating courses used to meet the 33 semester hours (48 quarter hours) construction core requirements of the Student Learning Outcomes.

Please see Table 3.1 at the end of this section.

- 3.1.6.2 Provide a syllabus in Volume II for each course used to support the Student Learning Outcomes. Syllabi for the courses taught by the program shall include the following:
- Course Learning Outcomes in relation to the Student Learning Outcomes,
  - Instructional methods,
  - Topical outline,
  - Method of assessment of course learning outcomes, and
  - Grade performance criteria.

Syllabus for each courses is provided in Volume II.

- 3.1.6.3 Evaluate each Student Learning Outcome by a minimum of two assessment methods, at least one of which must be direct, and identify the individual courses where each of the Student Learning Outcomes has been included. This may be best done with a table identifying the specific assessment methods used for each Student Learning Outcome and indicate which are considered to be direct assessment measures. (NOTE: If student teams or group projects are used for assessment, there must also be a process in this team/group environment to assess individual student learning.)

Please see Table 3.2 at the end of this section.

- 3.1.6.4 Provide evidence in the form of assessment tools, any associated grading rubrics, and one example of graded student work to prove adequacy of the assessment tool in evaluating students' ability to meet each Student Learning Outcome. Programs using third-party certifications shall provide comprehensive results for each Student Learning Outcome where such assessment is applied.

This information is provided in SLO folders.

- 3.1.6.5 Provide evidence that the results obtained from the formal assessment of the Student Learning Outcomes have been included as part of the quality improvement plan.

Results obtained from formal assessment of each SLO are reported in individual SLO folders. This information has been included in QIP document (in Volume II) and also reported in Chapter 9 of this document.

- 3.1.6.6 Provide a report of the methods of assessment for each Student Learning Outcome, and the most recently reported evaluation of the results, resulting actions, and a follow-up of these actions on student performance including dates of each of these.

This information is provided in detail in SLO folders. It is summarized in Table 3.3

**Table 3.1 Construction Core Courses and related Student Learning Outcomes**

*Shaded box with check mark showed the SLO assessed in the particular course. Check mark showed the course which cover the related SLO*

Courses	Credit Hours	SLO # 1	SLO # 2	SLO # 3	SLO # 4	SLO # 5	SLO # 6	SLO # 7	SLO # 8	SLO # 9	SLO # 10	SLO # 11	SLO # 12	SLO # 13	SLO # 14	SLO # 15	SLO # 16	SLO # 17	SLO # 18	SLO # 19	SLO # 20
CEM 100	3												✓	✓		✓	✓	✓			
CEE 121												✓									
CEM 250	4								✓										✓		
CEM 253	3							✓													✓
CEM 270	3																			✓	
CEM 301	2	✓					✓							✓				✓			
CWM 330	3								✓											✓	
CEM 350	3				✓			✓	✓						✓				✓		✓
CEM 351	3	✓						✓	✓										✓		✓
CEM 370	3																			✓	
CEM 372	3																			✓	
CEM 432	3												✓								
CEM 450	3		✓						✓				✓			✓				✓	
CEM 451	4				✓				✓		✓										
CEM 452	3			✓			✓						✓	✓			✓				
CEM 453	3		✓			✓				✓	✓				✓						
CEM 454	3		✓																		
CEM 455	3				✓	✓			✓				✓			✓		✓			
CEM 480	3																		✓		
CEM 485	3							✓						✓				✓			
<b>Total Credits</b>	<b>58</b>																				

**Table 3.2 List of Courses and Specific Assessment Methods used to Assess the Student Learning Outcomes**

DA = Direct Assessment      IA = Indirect Assessment

Assessed in	SLO # 1	SLO # 2	SLO # 3	SLO # 4	SLO # 5	SLO # 6	SLO # 7	SLO # 8	SLO # 9	SLO # 10	SLO # 11	SLO # 12	SLO # 13	SLO # 14	SLO # 15	SLO # 16	SLO # 17	SLO # 18	SLO # 19	SLO # 20	
CEM 100												DA					DA				
CEE 121											DA										
CEM 253							DA														
CEM 270																			DA		
CEM 301	DA					DA							DA				DA				
CEM 350																		DA		DA	
CEM 351																		DA		DA	
CEM 450		DA													DA						
CEM 451				DA				DA		DA											
CEM 452			DA			DA							DA	DA		DA					
CEM 453		DA			DA				DA	DA											
AIC Exam Results	DA*	DA*	DA*	DA*	DA	DA	DA	DA	DA*	DA*	DA*	DA	DA	DA	DA	DA	DA	DA	DA	DA	
Senior Exit Survey	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID
Alumni Survey	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID
Employer Survey	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID

**AIC exam** data is reported for all SLO's. \* indicate SLO's for which exam results may not be sued.



**Table 3.3. Methods of Assessment, Reported Evaluations, Resulting Actions & Follow-Up Activities for Each SLOs**

 Yes
  Partially
  No

Student Learning Outcomes	Assessment Method	FY 2017/2018		Outcome Achieved	FY 2018/2019 Resulting Actions & Follow-Up
		Outcome Achieved	Resulting Actions & Follow-Up		
SLO # 1: Create written communications appropriate to the construction discipline.	Direct	Yes	No actions or follow-up were required.	Yes	The AIC exam results improved and exceeded the national mean
	Indirect	Yes	As all the three assessment measures exceeded our threshold, no action was taken.	Yes	No actions or follow-up were required as graduates rated this outcome higher than our threshold.
SLO # 2: Create oral presentation	Direct	Yes	Data collected was group based in CEM 453 course. Instructor will start collecting data of individual student's performance from next year.	Yes	It was decided that this SLO will be assessed in CEM 450 course in future, because in CEM 453, the oral presentation was removed.
	Indirect	Yes	No actions or follow-up were required.	Yes	No actions or follow-up were required, because the Senior Exit survey results were good for this SLO.
SLO # 3: Create a construction project safety plan	Direct	Data not collected	This SLO was not assessed in any course. However, the faculty decided to assess this SLO in CEM 452 course from the next fiscal year.	Yes	As the instructor of CEM 452 included this SLO related material in the course contents, the performance criteria was met.
	Indirect	Partially	It is anticipated that after introducing dedicated project safety plan exercise in CEM 452 course, the Senior Exit survey result will improve.	Yes	Due to the action taken during previous fiscal year, the Senior Exit survey result also exceeded the threshold.

Student Learning Outcomes	Assessment Method	FY 2017/2018		Outcome Achieved	FY 2018/2019 Resulting Actions & Follow-Up
		Outcome Achieved	Resulting Actions & Follow-Up		
SLO # 4: Create construction project cost estimates	Direct	No	As the course assessment performance criteria for this SLO did not meet, the instructor of CEM 451 increased the delivery time of this topic.	Yes	Due to the action taken during previous fiscal year, the course assessment and AIC exam results improved significantly.
	Indirect	Partially	Due to lack of time devoted on the topic related to this SLO in the class, the graduates also felt that they lack the skill related to this SLO. It is anticipated that due to action taken in CEM 451 course, this indirect measure will also improve.	Yes	As the course content delivery time was increased, it has a positive effect on Senior Exit survey results.
SLO # 5: Create construction project schedules	Direct	Yes	No actions or follow-up were recommended.	Yes	AIC exam result exceeded the national mean.
	Indirect	Partially	No actions or follow-up were recommended.	Yes	No actions or follow-up were required.
SLO # 6: Analyze professional decisions based on ethical principles.	Direct	Partially	AIC exam result was below national mean. The instructor of CEM 455 course will review the materials related to this SLO in future.	Yes	Due to the action taken during previous fiscal year, the AIC exam result exceeded the national mean.
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required

Student Learning Outcomes	Assessment Method	FY 2017/2018		Outcome Achieved	FY 2018/2019 Resulting Actions & Follow-Up
		Outcome Achieved	Resulting Actions & Follow-Up		
SLO # 7: Analyze construction documents for planning and management of construction processes	Direct	Partially	As AIC exam result was below national mean, the CEM 455 instructor covered this SLO-related material comprehensively in the class.	Yes	Due to action taken during 2017/18, the AIC exam result exceeded the national mean.
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 8: Analyze methods, materials, and equipment used to construct projects.	Direct	No	As the course assessment performance criteria for this SLO did not meet the performance criteria, the instructor of CEM 451 increased the delivery time of this topic.	Yes	Due to the action taken during previous fiscal year, the course assessment and AIC exam results improved significantly.
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 9: Apply construction management skills as an effective member of a multi-disciplinary team.	Direct	Yes	No actions or follow-up were required	Yes	The faculty also introduced CEM 456 Capstone course from Fall 2020. This SLO will be assessed in this class.
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 10 Apply electronic-based technology to manage the construction process	Direct	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 11: Apply basic surveying	Direct	Yes	The students were laying out of a horizontal curve. The faculty	Yes	No actions or follow-up were required

Student Learning Outcomes	Assessment Method	FY 2017/2018		Outcome Achieved	FY 2018/2019 Resulting Actions & Follow-Up
		Outcome Achieved	Resulting Actions & Follow-Up		
techniques for construction layout and control			gave extra the lab work to layout foundation.		
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 12: Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.	Direct	Data not collected	The course assessment data was not collected this year. Therefore the faculty assessed this SLO in CEM 100 course and the data was collected from Fiscal Year 2018/2019.	Yes	No actions or follow-up were required  In Fall 2019, this SLO was assessed in CEM 100 and the performance criteria was met.
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 13: Understand construction risk management	Direct	Partially	To improve the AIC exam result, the instructor of CEM 455 course reviewed this SLO-related material in the class.	Yes	Due to action taken during Fiscal Year 2017/18, the AIC exam result improved.
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 14: Understand construction accounting and cost control	Direct	Partially	To improve the AIC exam result, the instructor of CEM 455 course reviewed this SLO-related material in the class.	Yes	Due to action taken during Fiscal Year 2017/18, the AIC exam result improved.
	Indirect	Partially	It was assumed that after above intervention, the Senior Exit survey data related to this SLO will also improve.	Yes	Due to intervention in CEM 455 course, the graduates rated this SLO higher than our threshold.

Student Learning Outcomes	Assessment Method	FY 2017/2018		Outcome Achieved	FY 2018/2019
		Outcome Achieved	Resulting Actions & Follow-Up		
SLO # 15: Understand construction quality assurance and control	Direct	Partially	To improve the AIC exam result, the instructor of CEM 455 course reviewed this SLO-related material in the class.	Yes	Due to action taken during Fiscal Year 2017/18, the AIC exam result improved.
	Indirect	Partially	It was assumed that after intervention in CEM 455 course, the Senior Exit survey data related to this SLO will also improve.	Yes	Due to intervention in CEM 455 course, the graduates rated this SLO higher than our threshold.
SLO # 16: Understand construction project control processes	Direct	Partially	As AIC exam result was below national mean, the CEM 455 instructor reviewed this SLO-related material comprehensively in the class.	Yes	Due to action taken during 2017/18, the AIC exam result exceeded the national mean.
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 17: Understand the legal implications of contract, common, and regulatory law to manage a construction project.	Direct	Data not collected	This SLO will be assessed on CEM 100 and CEM 301 course from next fiscal year. As AIC exam result was poor, the CEM 455 instructor reviewed this topic in detail during this class.	Yes	Due to action taken during previous fiscal year, the assessment performance criteria met. In Fall 2019, this SLO was assessed in CEM 100 course and the performance criteria was met.
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 18: Understand the basic principles of	Direct	Yes	No actions or follow-up were required	Yes	The faculty decided to assess this SLO in CEM 480 Sustainable Construction course from next fiscal year.

Student Learning Outcomes	Assessment Method	FY 2017/2018		Outcome Achieved	FY 2018/2019 Resulting Actions & Follow-Up
		Outcome Achieved	Resulting Actions & Follow-Up		
sustainable construction.	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 19: Understand the basic principles of structural behavior	Direct	Partially	The course assessment did not meet the performance criteria. Therefore the instructor of CEM 270 course spent additional time on lectures and problem solving sessions, and revised slides to better address students' needs.	Yes	Due to the intervention of course instructor, the course assessment data met the performance criteria.
	Indirect	Yes	No actions or follow-up were required	Yes	No actions or follow-up were required
SLO # 20: Understand the basic principles of mechanical, electrical and piping systems.	Direct	Partially	As AIC exam result was below national mean, the CEM 455 instructor reviewed this SLO-related material comprehensively in the class.	Yes	Due to action taken during 2017/18, the AIC exam result exceeded the national mean.
	Indirect	Yes	No actions or follow-up were required	Partially	The instructor of CEM 350 and CEM 351 was instructed to review content so that student can have required MEP knowledge.

### **3.2 Courses Delivered by Alternate Forms of Delivery**

If the program offers courses by alternate means, list each course and indicate how each course meets the following conditions:

The program offers CEM 100, CEM 250, CEM 350, CEM 351, and CEM 480 in the online-only format. The contents of courses are same to that provided previously as a face-to-face course. The learning objectives are also same. Only the delivery method has been changed to increase the number of enrolled students in the courses and provided increased flexibility for the students. This increased flexibility allows students in other parts of the State of Nevada to take these construction courses online before actually physically being present in Southern Nevada.

- 3.2.1** The alternative courses will be accepted for transfer credit as reviewed and accepted by the accredited university programs.
- 3.2.2** The program standing for initial accreditation or renewal of accreditation shall display the same kind of course material for evaluation of alternative courses as set forth in this document for a conventionally offered classroom lecture or laboratory course. Online course materials, including examples of student work, may be presented for review in online format as long as they are readily accessible to the Visiting Team and are accurately identified with course number and semester (or quarter).
- 3.2.3** Construction specific courses shall be evaluated for content as per Document 103, regardless of delivery format.
- 3.2.4** Programs that offer the same course via different delivery methods (i.e., live classroom and online) shall demonstrate that courses with the same course number have consistent content and learning Objectives.

### **3.3 Multiple Campus Degree Program Delivery**

If the degree program is offered on another campus, indicate how the program meets the following conditions:

**The program is only offered at one location i.e. UNLV campus.**

- 3.3.1** There is a single institution authorized to grant the degree. The institution is to provide evidence through student diplomas and transcripts from all campuses.
- 3.3.2** The degree program is led by a single qualified administrator from the home campus.
- 3.3.3** The degree program administrator has sufficient authority and experience to be able to provide the required leadership and supervision that allows the development of a strong academic degree program.

- 3.3.4** There are adequate faculty and staff to successfully facilitate the degree program at different geographic campus locations.
- 3.3.5** Degree program curriculum, Student Learning Outcomes, and the degree requirements are the same on all campuses.
- 3.3.6** If multiple educational units are involved to support the degree program,
  - 3.3.6.1 They shall use only one academic quality plan identifying the process used for the continuous improvement of the degree program.
  - 3.3.6.2 The goals and objectives of the educational units need to be aligned to facilitate the success of the degree program and its continual improvement.
- 3.3.7** One educational unit shall be identified as the home for the degree program. This unit shall be responsible for the successful delivery of the degree program and is the geographical base for degree program operations.
- 3.3.8** If your split (dual) program is not meeting all of these conditions, explain why the degree programs are not being accredited independently as required by ACCE Standards Document 103.

### **3.4 Dual or Second Degrees**

If there is a second degree programs or modified curricula educational units accepting second or dual degree students into an ACCE accredited undergraduate construction program, indicate how the modified degree path for those students fulfills the required curriculum standards.

### **There is no Dual or Second Degree Program**



## 4. FACULTY AND STAFF

### 4.1 Requirements

#### 4.1.1 FACULTY QUALIFICATIONS

- 4.1.1.1 Describe the academic qualifications, professional experience, and scholarly/creative activities of the faculty and provide curricula vitae for all faculty members in the program in Appendix A in Volume II. If applicable, describe the regional accreditation organization's requirements for faculty assignment and how the program complies with them.

##### Information about faculty

##### Tenured or Tenure Track (CVs are also found in Appendix A of Volume II)

Name and Rank	Qualifications	Professional Experience	Scholarly Activities
<b>Sajjad Ahmad Professor</b>	PhD; PE	17 years in academia	97 Journal Publications; 85 Conference Proceedings
<b>Pramen Shrestha Professor</b>	PhD; PE	12 years in academia and 10 years industry	41 Journal Publications; 70 Conference Proceedings
<b>Neil Opfer Associate Professor</b>	MS (MBA); PD	30 years in academia and consulting; 12 years industry	12 Journal Publications; 8 Book Chapters; 63 Conference Proceedings
<b>JinOuk Choi Assistant Professor</b>	PhD	2 years professional and 5 years academia	13 Journal Publications; 15 Conference Proceedings
<b>Jee Woong Park Assistant Professor</b>	PhD	2 years professional and 2 years academia	17 Journal Publications; 30 Conference Proceedings

##### Part-time Faculty (CV's are found in Appendix A of Volume II)

Name	Qualifications	Professional/ Academic Experience
Kazem Jadidi	Ph.D. Civil Eng.	11 years of professional/ 6 years academic
Chris Parker	M.S. Civil Eng.	9 years of professional/ 7 years academic
Jared Englehart	B.S.C.M	12 years of professional/ 3 years academic
Lars Evensen	J.D.	25 years of professional/ 7 years academic
James Lucas	M.S. Civil Eng./ MBA	36 years of professional/ 17 years academic
Brandon Moore	BSBC/ MBA	14 years professional/ 9 years academic
Doug Rounds	M.S. Civil Eng.	21 years professional/ 10 years academic
Bryan Osborne	M.S. Civil Eng.	20 years professional/ 12 years academic

- 4.1.1.2 Describe the process of how faculty are assigned teaching responsibilities, including how they have demonstrated expertise and adequate background in the areas assigned.

Faculty are assigned teaching duties based on experience, background, and desires. The department chair works with faculty to ensure courses are covered and to assure the appropriate faculty member is assigned to a particular course.

- 4.1.1.3 Evaluation of faculty competence shall recognize appropriate professional experience as being equally as important as formal educational background.

Faculty are assigned teaching based on experience but must have the minimum academic qualifications. When the course expertise does not reside in tenured or tenured tract faculty members, highly experienced part-time instructor are hired from the industry or retired professionals. The minimum requirement for hiring part-time faculty members is a bachelor's degree and substantive industry experience.

#### **4.1.2 FACULTY SIZE**

- 4.1.2.1 List the teaching, administrative, research, and other assignments for each faculty member for the past academic year. Include course, list type (lecture, online, lab, etc.), number of lecture hours, number of laboratory hours, number of separate preparations, class size, and availability of teaching assistants. Also include faculty member's counseling activities, administrative activities, committee assignments, extension or continuing education commitments, and research activities.

<b>Faculty Member Name</b>	<b>Course</b>	<b>Class Size</b>	<b>Credits hours</b>	<b>TA</b>	<b>Administrative Duties</b>
Sajjad Ahmad	CEE 750	15	3	No	<ul style="list-style-type: none"> <li>• Department Chair</li> <li>• 40% research</li> <li>• Member Executive Committee College of Engineering</li> <li>• Mentor for 15 undergraduate students</li> <li>• Adviser for 6 Graduate students (4 PhD; 2 MS)</li> </ul>
Pramen Shrestha	CEE 340	13	3	No	<ul style="list-style-type: none"> <li>• Graduate Coordinator</li> <li>• 40% research</li> <li>• Mentor for 15 undergraduate CEM students</li> <li>• Adviser for 5 Graduate students (2 PhD; 3 MS)</li> </ul>
	CEM 705/ CEE 785	16	3	No	
Neil Opfer	CEM 100	37	3	No	<ul style="list-style-type: none"> <li>• Faculty Senator</li> <li>• OSHA Training – UNLV Solar Decathlon Team</li> <li>• Adviser of 2 MSCM Graduate students and Mentor of 20 UGs</li> <li>• Advisor NAHB Student Chapter</li> </ul>
	CEM 250	28	3	No	
	CEM 253	9	3	No	
	CEM 350	13	3	No	
	CEM 351	14	3	No	
	CEM 450	6	3	No	
JinOuk Choi	CEM453 /653	18	3	Yes	<ul style="list-style-type: none"> <li>• 40% research</li> <li>• Faculty Advisor Solar Decathlon Competition</li> <li>• Member Faculty Search Committee</li> <li>• Mentor for 22 undergraduate CEM students</li> <li>• Adviser for 5 Graduate students (3 PhD; 2 MS)</li> </ul>
	CEE 710	7	3	No	
Jee Woong Park	CEM 270	22	3	Yes	<ul style="list-style-type: none"> <li>• 40% research</li> <li>• Member Faculty Search Committee</li> <li>• Mentor for 20 undergraduate CEM students</li> <li>• Adviser for 7 Graduate students (5 PhD; 2 MS)</li> </ul>
	CEE 720	11	3	No	

<b>Instructor Name</b>	<b>Course</b>	<b>Class Size</b>	<b>Credits hours</b>	<b>TA</b>
Eric Elison	CEM 330	12	3	No
Doug Rounds	CEM 370	15	3	No
	CEM 372	14	3	No
Bryan Osborne	CEM 432/632	13	3	No
Charlie Thomas	CEM 450	13	3	No
Williams Harris	CEM 451/651	17	4	No
James Lucas	CEM 454/654	15	3	No
	CEM 455	8	3	No
Brandon Moore	CEM 480/680	15	3	No
	CEM 480/680	27	3	No
Lars Evensen	CEM 485/685	20	3	No

- 4.1.2.2 Compare the program’s faculty size to that of comparable academic programs within the institution, including number of faculty member, number of courses offered, number of students enrolled, and type of instruction.

Department	Number of Faculty	No of Courses Offered	Student Enrollment UG/Grad	Type of Instruction
Civil and Environmental Engineering and Construction	18	47 CEE	250/ 84	Mostly Face to face with some on-line only courses
		22 CEM	96/5	
		Total 69	346/ 89	
Mechanical Engineering	17	52	586 / 99	Mostly Face to face with some on-line only courses

Comparable academic program within the College of Engineering is Mechanical Engineering Program (ME). ME offers less courses compared to CEEC, however, they have 70% more undergraduate students. The faculty and undergraduate student ratio (19 vs 34) is much better for CEEC compared to ME and is expected to get even better because CEEC has 3 open positions. Once filled, this will bring total full time faculty size of CEEC to 21.

- 4.1.2.3 Describe the process used to determine when new or additional faculty members are needed and how other responsibilities and services are used in the determination of faculty needs.

The number of full time faculty is a balance between budget realities and the priority to be a productive entity at an R1 university. A request for a new faculty line to provost either requires teaching needs (growing program) or research needs (potential to secure funding from external agencies). A decision to hire a new full-time faculty member is collaborative among faculty. Full time faculty appointments are voted on by faculty.

### 4.1.3 FACULTY WORK LOAD

- 4.1.3.1 Describe the process by which the faculty workload is distributed.

The full teaching load for tenured and tenure track faculty, without any research activity, is six courses per year. However, most tenured and tenured track faculty operate on a work plan of 40% teaching, 40% research, and 20% service. With this work plan, normal teaching load for tenured and tenure track faculty in the Department is three courses per year. Each faculty member, during annual evaluations, can discuss adjustments in their workload distribution (research, teaching, service) for next year based on their research or service commitments.

- 4.1.3.2 Describe how number of lecture hours, number of laboratory hours, number of separate preparations, class size, availability of teaching assistants, counseling and advising activities, administrative activities, committee assignments, extension or continuing education commitments, and research activities are considered when assigning workload.

Newly appointed assistant professors on tenure track get further course load reduction and teach only 2 courses per year for first 3 years of their appointment. This helps them to establish their research and provide additional time for new course preparation. A one course release is provided to those faculty members who have significant service assignments such as serving as undergraduate and graduate coordinator, bringing the teaching load down to 2 courses per year. The department chair, in consultation with faculty members, makes course assignments based on teaching needs, the expertise of a faculty member, number of students, and the complexity of the course. Each course with a laboratory component gets a TA assigned regardless of number of students. A faculty member can be assigned a TA for any undergraduate course that is over 30 students. All faculty members are assigned an equal number of undergraduate students to advise. Advising graduate students mostly depends on how many active grants a faculty member has to support graduate students. Service assignments are discussed and made between the department chair and individual faculty members. Service assignments consider research productivity, service assignment time commitments, and a faculty member's interest. Significant service commitments also result in a course load reduction. Part time faculty's workload is normally based solely on teaching. Their assignments are based on teaching needs of the department and typically each part time instructor only teaches one course per semester. TAs are also available to lecturers or affiliates for courses with over 30 students.

#### 4.1.4 ADMINISTRATIVE AND TECHNICAL STAFF SUPPORT

- 4.1.4.1 List the administrative and technical support for the program, then list the current support staff of the construction educational unit and their assignments. Include clerical staff, technicians, and non-teaching graduate assistants. Indicate the percentage of full time employment.

Table showing Current Support Staff

Name	% Full Time	Assignment
Gregory DeVaul	100%	Administrative Assistant
Larese Patillo	100%	Administrative Assistant
Kazim Jadidirendi	100%	Teaching Laboratory Manager
Peter Faight	100%	Research Laboratory Manager
Darlene De La Cruz	25-50%	Student worker

- 4.1.4.2 Compare the program’s support to that of degree programs of similar size and function within the institution.

Support is comparable to other departments in the college of engineering. For example, Mechanical Engineering also has two laboratory managers, two administrative assistants, and one student worker.

#### 4.1.5 EMPLOYMENT POLICIES

- 4.1.5.1 Provide construction faculty salaries and comparable faculty salaries within like educational units within the institution for the current year. Data that would reveal individual salaries may be omitted and provided directly to the visiting team. Indicate the average 9 month salaries by rank. Convert all 12 month salaries to 9 month salaries. Indicate the conversion factor from 12-month to 9-month salaries.

##### Average Salary Data

<b>Rank</b>	<b>CM faculty</b>	<b>CEEC faculty</b>
Professor	\$141,200	\$146,700
Associate Professor	\$100,500	\$103,800
Assistant Professor	\$87,200	\$86,200

*UNLV does not offer 12-month salary contracts. Administrators such as department chair receive 11-month salary. The conversion factor used from 11 months to 9 months salary is 9/11 (0.82).*

- 4.1.5.2 List the current faculty of the construction educational unit, including part-time and graduate instructors. List the full-time faculty first, grouped alphabetically within rank. Indicate the rank at the head of each group. Show the full-time equivalence (FTE) for each part-time faculty member (i.e., .25 for quarter-time). Indicate years on staff as of the end of the current academic year. Indicate tenure status and whether an academic year (9 mo.) or fiscal year (12 mo.) appointment.

Name	FTE	Highest Degree	Years on Staff	Tenured	Tenure Track	Non-Tenure Track	9 Month	12 Month
Tenure/Tenure Track Faculty								
Sajjad Ahmad	100%	Ph.D.	14	Yes	NA	NA	No	Yes
Pramen Shrestha	100%	Ph.D.	13	Yes	NA	NA	Yes	No
Neil Opfer	100%	MS. (MBA) PD	30	Yes	NA	NA	Yes	No
Jin Ouk Choi	100%	Ph.D.	4	No	Yes	NA	Yes	No
Jee Park	100%	Ph.D.	3	No	Yes	NA	Yes	No
Part-Time Instructors								
Jared Englehart	6.3%	B.S.	8	No	No	No	Part-Time Instructor	No
Lars Evensen	12.5%	J.D.	11	No	No	No	Part-Time Instructor	No
James Lucas	37.5%	M.S.	17	No	No	No	Part-Time Instructor	No
Brandon Moore	25%	M.B.A.	10	No	No	No	Part-Time Instructor	No
Doug Rounds	25%	M.S.	10	No	No	No	Part-Time Instructor	No
Bryan Osborne	12.5%	M.S.	12	No	No	No	Part-Time Instructor	No

#### 4.1.6 PROFESSIONAL DEVELOPMENT

4.1.6.1 Describe the professional development opportunities provided to faculty members.

UNLV offers several professional development opportunities through office of Faculty Affairs and office of Academic Assessment. These offices conduct trainings and bring resource persons from outside as needed. Faculty members are encouraged to join and participate in professional societies, but the Department does not directly pay the Faculty member's dues. All research-

active Faculty have “indirect cost recovery accounts”, in which they receive a percentage of overhead paid on their research grants. Faculty can use these accounts to pay for membership dues. To the extent possible the CEEC Department supports travel to attend professional society meetings, especially if the Faculty member is involved in a leadership role or is presenting a paper. The construction-unit Faculty are active in the following professional organizations:

<b>Association</b>	<b>Dr. Ahmad</b>	<b>Dr. Choi</b>	<b>Professor Opfer</b>	<b>Dr. Park</b>	<b>Dr. Shrestha</b>
American Institute of Constructors			✓		
American Society of Civil Engineers	✓	✓		✓	✓
American Society for Engineering Education			✓		
American Society of Safety Engineers (now ASSP)			✓		
American Welding Society			✓		
Association for Advancement of Cost Engineering			✓		
Associated Schools of Construction	✓	✓	✓	✓	✓
Construction Research Council		✓		✓	✓
Construction Financial Management Association			✓		
Construction Management Association of America			✓		✓
Illuminating Engineering Society of North America			✓		
Project Management Institute			✓		
Modular Building Institute		✓			



- 4.1.6.2 Describe consulting work conducted by faculty members and the process for balancing consulting and assigned duties and responsibilities.

Faculty members are permitted one day per week (20% of time) for outside consulting, and must submit an approval form to the Chair and the Dean. The form asks for the details and time commitments of the consulting activity. This form ensures that there is not conflict of interest and time commitment will not impact the faculty member's regular duties. At present Dr. Ahmad, Dr. Park and Professor Opfer are active in consulting.

#### **4.1.6 FACULTY EVALUATION**

- 4.1.7.1 Describe the process used in faculty evaluation and how this is used to maintain high quality instruction. Include samples of any instruments or forms used.

The Department requires that each course must be evaluated by students. This process is completed by using standardized forms developed by the UNLV. However, faculty have the ability to add questions to these forms. Two years ago this process has been moved online. All student evaluations are reviewed by the Department Chair at the end of each semester. Specific quality of instruction issues are discussed with each faculty member. An example of the student evaluation form is found in Appendix F Volume II of this self-study.

All new tenure track hires are encouraged to attend teaching workshops offered outside of UNLV. For example, most of our faculty hired in past 3 years have already attended Excellence in Teaching Workshop offered by American Society of Civil Engineers (ASCE ExCEED). UNLV offers several workshops on syllabus development, teaching techniques, assessment techniques, and creating innovative assignments. UNLV also offers a peer-teaching evaluation process. This process is not mandatory for all faculty. However, a faculty member or chair can request the assignment of a mentor, if there is a reason to believe that faculty member might benefit from feedback from a peer. Peer reviewers meet with the faculty member being reviewed, attend a class, write a review of the teaching, and provide feedback both orally and in writing to the faculty member.

As part of the department's merit review process, Faculty are asked to write a self-reflective opening statement on their teaching effectiveness. This statement provides reflection on how to improve future classes.

- 4.1.7.2 Define the educational institution's faculty evaluation cycle.

Tenured and tenure track faculty are required to submit an annual report on their teaching, research, and service accomplishments to the department chair. This report covers activities during past calendar year i.e., from Jan 1 to Dec 31. Report is due by January 31. The department chair reviews these reports and meets one-on-one with faculty members to discuss their performance and future goals. Report is then forwarded to the Dean. Faculty on tenure

track also receive a required mid-tenure review both by Department Faculty and Department Chair. There is also an optional mid review for faculty who are associate professors.

Every tenured and tenure track faculty member is reviewed by the department chair once a year. For part time faculty, the department chair reviews student evaluations. Generally, the chair does not meet with part-time faculty unless mentoring or additional counseling is required.

## **5. STUDENT POLICIES**

### **5.1 Requirements**

#### **5.1.1 ACADEMIC POLICIES**

- 5.1.1.1 Describe the existing written policies indicating required courses and acceptable elective courses that meet degree program objectives and the Student learning Outcomes.

For the CM program, the policies indicating the required courses are shown in the CEEC Department website (<https://www.unlv.edu/ceec>). There are no acceptable elective courses; curriculum consists of required courses. All the CM students must take these required courses in order to graduate.

- 5.1.1.2 Describe how these policies are developed with input from faculty, student and other stakeholders of the degree program.

As a part of the department Quality Improvement Plan, the faculty annually conduct retreats and review the collected data to determine curriculum and operational improvements that should be undertaken. A subcommittee of the department's industry advisory board is responsible for helping to identify contemporary topics that need to be introduced to undergraduate and graduate students. Student input is gathered through senior exist survey at time of graduation. Alumni and Employer input is collected through surveys conducted every 3 years.

#### **5.1.2 TEACHING QUALITY**

- 5.1.2.1 Explain the process which exists in the degree program for ensuring quality of teaching by full-time and part-time faculty that is consistent with the degree program's mission and objectives.

The Department requires that each course must be evaluated by students. This process is completed by using standardized forms developed by the UNLV. These forms are delivered to the students online through their email and the data are collected and analyzed by the Provost's Office. However, faculty have the option to provide their own questionnaire to collect specific information from the students in order to improve the quality of teaching. All student evaluations are reviewed by the department chair at the end of each semester. Specific quality of instruction issues are discussed with each faculty member. This discussion typically occurs during annual review.

As part of the department's annual review process, faculty are asked to write a self-reflective statement on their teaching effectiveness. This statement provides reflection on how to improve future classes.

- 5.1.2.2 Describe the systematic assessment mechanism with clear metrics that is in place for evaluating the quality of teaching within the degree program.

Teaching is one aspect of a faculty member's workload. Each faculty is rated as "excellent," "satisfactory," or "unsatisfactory" by the department chair on the teaching portion of a faculty member's annual review. This rating is based on a combination of a faculty member's student evaluations, course development and updates, and self-reflection. AIC exam results also provide useful information and any weakness identified are traced back to courses and instructors. Student evaluations of instructors in each course, and instructor evaluation during senior exit surveys are also important data points to identify issues in teaching quality. We send all new hires to attend American Society of Civil Engineers, Excellence in Teaching Academy (Exceed). Senior faculty members are encouraged to attend several courses provided by UNLV to improve their teaching methods.

### **5.1.3 ADMISSIONS AND ENROLLMENT**

- 5.1.3.1 Demonstrate how the admission process for students enrolling in the degree program reflects students' potential for success in both academic studies and professional practice.

We accept students twice a year in the spring and fall. We also accept transfer students into our program. UNLV admissions process is primarily based on academic track record (GPA and score on standardized tests). However, once students are in the program, there are opportunities to join student organizations, participate in internships, tutoring, and mentoring programs to improve student success in both academic studies and professional practice.

- 5.1.3.2 Describe how the admission process for the degree program reflects institution-wide policies as well as the program's mission, goals, and objectives, including the admission of internal and external transfer students.

As a university, we strive to recruit and support as diverse a student population as possible. To that end, we treat UNLV students and transfer students as equals in the application process. We want students who come from both traditional and nontraditional academic pathways.

### **5.1.4 RECRUITMENT AND COMPOSITION**

- 5.1.4.1 Describe the degree program's aspirations regarding student composition and how the program's recruitment and retention mechanisms support those aspirations.

As part of our recruitment efforts, we present program information to various groups across campus including other engineering programs and to groups visiting from high schools. In terms of

retention, we work hard as a department to support students from diverse backgrounds by fostering an environment of inclusion. Our recruitment efforts specifically focus on schools and technical academies, which have high percentage of minority students. This is in line with UNLV status as minority serving student.

- 5.1.4.2 Explain how the degree program's recruitment is directed towards individuals with high academic achievement and community involvement as well as those with defined career goals in construction.

Admission in UNLV and the program is based on academic performance only:

3.0 GPA in 13 core units: English - 4; Math - 3; Social Science - 3; Natural Science - 3

OR

1120 SAT\* (EBRW and math) OR 22 ACT (composite score)

OR

Nevada Advanced High School Diploma

As a result, we do not consider other aspects such as community involvement. However, those aspects are considered in awarding financial aid and scholarships.

- 5.1.4.3 Compare the recruitment and publicity of the degree program to other programs in the institution.

The College of Engineering has a recruiting office that provides services to all programs. We also participate in College Programs to increase public awareness of our degree programs. In addition to that, we do our own marketing materials, recruitment efforts, which include setting-up an information booth at various University-wide events, and industry events. Our CEM Faculty regularly visit high schools especially career-tech high schools to advertise and recruit CEM students. Every year, for the past three years, our Department organizes a Construction Career Day Event held at UNLV. In this Career Day Event about 1,200 high school students participate on an annual basis. The Event includes UNLV Booths as well as exhibits from construction industry firms. This year (2019), this Event was organized and held at the College of Southern Nevada's Campus and UNLV was still an active participant.

## **5.1.5 ACADEMIC ADVISING AND MENTORING**

- 5.1.5.1 Describe the current academic advising process available to students in the degree program. Explain how this advising process includes competent, continuous and consistent advising to the students in the degree program.

In the Fall of 2001 the College of Engineering established a college-wide central Advising Center. The College of Engineering Advising Center does the primary advising for undergraduate students.

The addition of the College of Engineering Advising Center has taken advising burdens off the faculty and they now play a secondary role. Students are directed by the College of Engineering Advising Center to contact the Chair of the Dept. of Civil and Environmental Engineering and Construction for:

- Questions that are beyond their scope
- Waiver requests
- Career guidance questions

In accordance with College policy each student is assigned a faculty mentor. Students are required to meet with their faculty mentor a minimum of two times while at UNLV. Students are first required to meet with their assigned mentor prior to applying for their advanced standing status. The second meeting between student and mentor is prior to the students entering their designated capstone course CEM 456 which is typically within the students' last two semesters prior to graduating

Entering graduate students are advised by the Department's Graduate Coordinator until a faculty member has been selected as the student's program advisor. Graduate students must file an approved program before the completion of nine credits of course work after admission.

With the advent of the MyUNLV System, a student goes online and registers for a course. At the time of enrollment if course prerequisites are not met, enrollment is blocked. Then a student must go to the College of Engineering Advising Center to remove the enrollment block for the course by filling out a prerequisite waiver form to verify students meet prerequisites for the course they are trying to enroll into. If the student is currently enrolled in the prerequisite course(s) then the block is removed and the student may enroll in the course pending their final grade(s) in the prerequisite course.

- 5.1.5.2 Explain how students are well informed about and have adequate access to placement services and opportunities that are or may be available to them.

Freshman students are informed of placement options, typically for math, from the moment they attend New Student Orientation (NSO) prior to the start of their freshman year at UNLV. Transfer students are also informed of placement options during their first mandatory advising session prior to registering for courses and attending UNLV.

## **5.1.6 COURSE SCHEDULING**

- 5.1.6.1 Describe how courses within the degree program are offered in formats and times to ensure appropriate student access and timely completion of degree program requirements. In the table below list the required construction courses in the degree program with the number of sections and average enrollment for the most recent academic year.

*Table 5.1.6 Required Construction Courses – Sections and Enrollments*

Required Courses		Number of Sections			Average Enrollment
Course #	Title	Fall	Spring	Summer	
CEE 121	Elementary Surveying	1	1	1	50
CEE 301	CAD Tools for Civil Engineering Design	2	2		60
CEM 100	Fundamentals of Construction Management	1			50
CEM 250	Construction Material and Methods	1			35
CEM 253/L	Quantity Surveying and Document Analysis		1		15
CEM 270	Construction Engineering Mechanics	1			22
CEM 301	Construction Safety			1	12
CEM 330	Soils and Foundations for Construction		1		9
CEM 350	Facility Systems Design and Construction 1	1			15
CEM 351	Facility Systems Design and Construction 2		1		14
CEM 370	Steel and Wood Design in Construction		1		10
CEM 372	Concrete Design in Construction	1			14
CEM 432	Temporary Construction Structures		1		6
CEM 450	Construction Field Inspection		1		5
CEM 451/L	Construction Estimating	1			20
CEM 452/L	Construction Cost Control	1			11
CEM 453/L	Construction Scheduling	1			17
CEM 454	Heavy Construction Methods and Equipment	1			13
CEM 455	Construction Management Practice		1		4
CEM 480	Sustainable Construction	1	1		18
CEM 485	Construction Law and Contracts		1		12

*The average enrollment for the once a year course was taken by looking at the two most recent semesters the course was offered.*

## **5.1.7 STUDENT PLACEMENT**

- 5.1.7.1 Describe how the degree program or institution provides a student placement service that can effectively assist students in entering the job market.

Engineering Career Services was created in 2015 as a branch of the central office of UNLV Career Services. Hired to specifically work to help place engineering students into "meaningful work experiences", this team immediately created its own Engineering Job Board where engineering firms could post openings for either internships or jobs. This job board is still the first place engineering students look for openings ([www.unlv.edu/engineering/jobs](http://www.unlv.edu/engineering/jobs)). Since the fall of 2015, over 850 students have found internships and 600+ have found permanent work from the board.

In addition, workshops are available teaching students a variety of career enhancing skills, such as "How to Write a Better Resume", "How to Write a Cover Letter", "How to Interview and Get the

Job", "How to Negotiate Your Salary" and more. Since they began in 2015, 125 workshops have been held with an average attendance of 40 students in attendance.

Employers were and continue to be invited to the UNLV campus to host Information Sessions, an hour-long segment educating students about the company and the roles/positions it has available. Employers began offering to conduct their own workshops, such as "Mock Interviews & Networking". They also work with the College to offer "Employer Treks", an invitation from the employer to the students to visit the company location, tour and hear from engineers that work there.

Hiring Events, such as a STEM related job fair was created in 2016 with 45 employers. That grew in 2017 to 85 employers and in 2018 to 116 employers. Over 750 students attended the job fair in fall, 2018. This year, the STEM job fair will merge into the UNLV campus-wide career fair, the "Southern Nevada Career Fair" that will be hosted October 9th, 2019 at the Thomas & Mack with approximately 200 employers.

The College of Engineering will continue to host smaller, more targeted hiring events, such as "Hire an Engineer" in November, 2019. This event will pair employers with the students they wish to interview in 15 minute increments. To date, 30 employers have registered with 150 students signed up to be interviewed.

Engineering Career Services continues to work hard to prepare our students not only for "meaningful work experiences", but also for advancement in their career choice.

- 5.1.7.2 Provide the job titles and construction sector (residential, commercial, etc.) for all graduates in the most recent year. Provide the number of students where data is not available, who are not employed in the construction sector, and who have continued their education.

<b>Student Name</b>	<b>Title</b>	<b>Employer</b>	<b>Sector</b>
Student 1	Estimator	Universal Concrete Inc	Residential & Commercial
Student 2	Project Engineer	R & O Construction	Commercial
Student 3	Project Engineer	Kiewit	Heavy Construction
Student 4	Project Engineer	Shawmut Design And Construction	Commercial
Student 5	Engineering Technician	Nevada Department Of Transportation	Heavy Construction
Student 6	Junior Estimator	Helix Electric	Commercial
Student 7	Project Scheduler	Mgm Recreation And Supports Management	Commercial



Student 8	Project Engineer	Penta	Commercial
Student 9	Project Engineer	Whiting Turner	Commercial
Student 10	Project Engineer	Penta	Commercial
Student 11	Field Engineer	Kiewit	Heavy Construction
Student 12	Construction Superintendent	Lennar Homes	Residential Construction
Student 13	Project Engineer	Burke Construction	Commercial
Student 14	Project Engineer	Kiewit	Heavy Construction

All students are employed in construction sector. None, as of yet, have continued their education to graduate school.

### 5.1.8 EXTRACURRICULAR ACTIVITIES

- 5.1.8.1 Describe how students are encouraged to participate in activities that complement their academic studies, including students that are pursuing their education via alternative delivery methods.

There is a very robust employment situation in the local construction market. All students in the program get an internship. There are several student organizations (chapters) and competitions (ASC region 6 & 7; Solar Decathlon) that students are encouraged to participate. These student organizations run recruitment campaigns every year to find new members. In some courses opportunities for competition are announced to increase participation.

- 5.1.8.2 List specific industry-based professional and trade organizations that students in the degree program are involved with.

As a preamble to this Section, the reader needs to understand that the characteristics of the typical college student at UNLV including those in Construction Management differs from those at many institutions across the United States. The typical UNLV Student is often a first-generation college student in that no one in their immediate family or sometimes extended family has ever attended college before them. One key consequence of this is the lack of parental funds for college expenses. Therefore, the average UNLV Student has to work to pay for college expenses. Due to the urban character of the area, fortunately numerous work opportunities are available for students including usually in the construction industry with the exception of the “2008 Great Recession.” One typical goal of getting students involved in a student chapter is to give them a practical outlet outside of classes in order to hear and learn about the construction industry. Another goal is that they can gain related-construction work experience while in school by participating in civic projects such as building a handicapped ramp for a charity or similar projects. With the UNLV Construction Management Students who work (and almost all do), while they may be interested in a student chapter, practically they are involved in a constant juggling act of both heavy work responsibilities and school responsibilities. In this environment,

everything else tends to fall by the wayside. For students attending school in other areas of the country where parents have saved for their college expenses over the years plus in a smaller population center with limited work opportunities, a student chapter due to more available student time has a better chance to be successful.

The Associated General Contractors (AGC) Student Chapter and the U.S. Green Building Council (USGBC) Student Chapter have previously been active at UNLV. However, the AGC Student Chapter is presently inactive. Following the merger of the Construction Management Program and the Dept. of Civil and Environmental Engineering some construction management students began participating in the American Society of Civil Engineers (ASCE) Student Chapter. The ASCE Student Chapter is very active and attracts students from across campus, including some outside of the College of Engineering. The USGBC Student Chapter was created in 2009 and has been relatively successful. The membership is comprised of students in architecture, business, construction management, engineering and a few other majors.

The AGC Student Chapter has gone through a number of exercises to make it a vital organization with minimal success. The most recent effort began in-Fall 2008, with the establishment of a series of seminar courses CEM 199, 299, 399, and 499 which were an official part of the curriculum. Students were required to enroll in one of the courses every semester until they reached graduation. The seminar was held once a month and a guest speaker was hosted. Following the guest speaker's presentation an AGC Student Chapter meeting was convened. CEM 199, 299, and 399 were zero credit courses and grades were Satisfactory/Unsatisfactory. When a student was enrolled in his or her last semester they would enroll in CEM 499 as a one credit course and would receive a grade for all the seminar courses attended. It was difficult to have all the students attend even though a special time was set aside such that no or few CEM courses would have a conflict. Students had conflicts with other courses, work conflicts, etc. The seminars usually had an enrollment of fewer than 50 percent of the eligible CEM students. Students that enrolled in the Construction Management Program prior to Fall 2008 were not required to participate as there was no way to make the requirement retroactive. Thus, the number of students participating was rather small. Students enrolled in the seminars were required to submit reports on the guest speaker's presentation and frequently failed to submit them and frequently failed to attend the seminar. Numerous students received unsatisfactory grades. Although the seminars were supposed to energize students about the AGC Student Chapter, the seminar concept failed in this respect. Many students would leave immediately following the Seminar and not participate in the Chapter Meeting. The Chapter did participate in a few civic events to help fix up local homes but it was always fewer than 10 students that participated in these projects. A few of the Chapter's Members also participated in the biennial Construction Career Day sponsored by the National Association of Women in Construction and later cosponsored by AGC along with the Clark County School District. In 2011, the Seminars were discontinued and removed from the Curriculum.

The characteristics of the AGC Student Chapter were as follows:

- Parent Chapter: Las Vegas Chapter of the Associated General Contractors
- Approximate number of members: 5 to 15
- Any student at UNLV could be a Member

- Purpose and activities: The purpose of the AGC Student Chapter was to provide students an opportunity to learn about activities including the following:
  - Regularly scheduled chapter meetings to plan and discuss events.
  - Field trips to local construction project sites.
  - Students could attend the Monthly Luncheon Meetings of the Las Vegas Chapter of AGC.

**Previous activities:**

- a. House of Cards Tournament: An event put on by the AGC Las Vegas Chapter in which local-area high-school students participated in a competition to build structures out of playing cards.
  - b. Construction Career Day: A biennial event sponsored by NAWIC, AGC, and Clark County School District to promote careers and university degrees in construction to high school students. Approximately 1500 high school students attend. Students assisted in hosting this event.
- The AGC of Las Vegas is anxious to reinvigorate the UNLV Student Chapter; it has been adopted as one of their upcoming goals. Discussions are currently underway to determine the best approach accomplish this goal.

U.S. Green Building Council (USGBC) Student Chapter

- Parent Chapter: USGBC Nevada Chapter, Center for Green Schools
- Approximate number of members: 15
- Any student at UNLV can be a member
- The purpose of the USGBC Student Chapter is:
  - To foster scientific study and research in the field of environmentally sustainable building and operation of buildings.
  - To develop and disseminate knowledge in sustainable building research and design.
  - To improve the methods and design of sustainable buildings.
  - To develop better public understanding and appreciation of the challenges and solutions posed by improved sustainable building practices and the sustainable operation of existing buildings.
  - To promote understanding, adoption and use of environmentally sustainable design, construction, and building operation practices across the University of Nevada, Las Vegas community.
  - To cultivate leadership skills among USGBC Student Chapter Members that will prepare them to champion sustainability on campus, in their community and in future careers.

The activities of the USGBC Student Chapter are:

- Regularly scheduled Chapter meetings to plan/discuss events.
- Green Apple Day of Service (9/27 each year).
- Professional Green Building Guest Speakers
- Green Building Tours
- Festival of Communities Booth
- Interaction with the Nevada Professional Chapter

Construction management students have standing invitations and are encouraged to attend the monthly meetings of the following organizations at student rates:

- Construction Management Association of America
- USGBC Nevada Chapter
- Southern Nevada International Code Council

A few students do take advantage of the student-rate benefit and attend these meetings.

The local section of the Construction Management Association of America has also expressed a strong interest in developing a Student Chapter at UNLV.

The Construction Program has recently established a NAHB (National Association of Home Builder's) Student Chapter at UNLV, as part of HELP Grant Award.

#### 5.1.8.3 State the extent of participation by students in extracurricular activities.

Students participate in several student competitions. Most of our CM students participate every year in ASC Regions 6 & 7 Student Competition that is held in the Reno, Nevada in February. In 2018 and 2019 our students took first place in the Design-Build Category. They also competed in the Commercial category. Our students are also taking part in this competition in February 2020.

### 5.1.9 STUDENT FEEDBACK

#### 5.1.9.1 Describe how the degree program's assessment process systematically uses student feedback as input in the continuous improvement process.

The Department Chair meet with the graduating students every semester to conduct an exit interview. During these sessions, we seek to assess student satisfaction by soliciting suggested improvements and discussing issues related to the CM program. Students do an anonymous exit survey where we gather an "indirect assessment" of their ability to achieve Student Learning Outcomes. Students also evaluate every course they take both for content and delivery. This information is used to assign instructors and modify contents, as needed.

### 5.1.10 FINANCIAL AID AND SCHOLARSHIP

Explain the mechanism by which the institution keeps students informed about the availability of financial aid.

Describe how the degree program informs students of scholarship opportunities.

For the College of Engineering, students are given the opportunity to apply for college specific scholarships for the upcoming academic year starting typically the first week of January. Students within the college are notified through email, advising appointments or class room visits that the application is available for them to fill out. The application is due around mid-February. It is the goal of the College of Engineering to award and notify students if they did or did not receive a scholarship by the end of the spring semester.

## **6. PHYSICAL RESOURCES**

### **6.1 Requirements**

If a split (dual) campus structure exists in the Construction unit, the responses and charts of this section are to be separated and identified by campus location.

#### **6.1.1. OFFICES, CLASSROOMS AND LABORATORY SPACES**

##### 6.1.1.1 Classrooms

- A. List the classrooms used for courses taught by the construction educational unit. Indicate the seating capacity, furnishings (i.e., fixed seats, tablet arm chairs), and environmental problems (i.e., lighting, cooling, noise, sun control).

In Spring 2019, the Nevada Legislature approved \$20M for Phase I of a new Advanced Engineering Studies Building. CEEC will also get space in this Building. This building will likely start construction in mid-2020 and be completed in 2022 and it is expected that it will solve the space problem in the College.

Currently, full-time faculty members have individual offices of reasonable size (160 sq. feet to 300 sq. feet). By default, faculty offices are equipped with one Windows work station provided by the Office of Information Technology (“UNLV IT”, for short and formerly referred to as “OIT”). Faculty members do not receive laptop computers or tablets; so those are mostly bought either through research grants or indirect cost recovery accounts (research active faculty receives a portion of overheads charged to their grants in an accounts). Most faculty offices are located on the third floor of the Engineering Building, TBE-B. Some faculty members have their office in the Science and Engineering building connected to the Engineering Building. The Science and Engineering Building (SEB) Administration supports collaboration among faculty in the sciences, engineering, health sciences, and other university research units. Faculty members move to this SEB Facility based on funded-research programs and on a committee recommendation of a university committee.

All teaching and research assistants in CEM Program have their desks in TBE B363. The College maintains a shared-designated office for professor emeriti. The administrative office of the CEEC Department is located on the second floor of the Engineering building TBE-A. This wing has the office of the Department Chair and work clusters for administrative assistants (AAs), and student workers. Copy machines and printers are stationed there as well. The wing also has a faculty conference room.

The majority of CEM Courses requiring traditional lectures are taught in classrooms located in several buildings on campus. Buildings with such classrooms are the TBE A and TBE B Buildings, Science and Engineering Building (SEB), Carol C Harter Classroom Building Complex (CBC), Education Building, and many other building complexes. Classrooms are assigned by the Academic

Scheduling Department under the Office of the Registrar. The classrooms are assigned on the basis of the class size and the needs of the faculty. All of the classrooms are equipped with multi-media features for lecturing, and the equipment includes a PC, LCD projector, Doc-Cam, and high-speed Internet connection. All of this multimedia equipment is provided and maintained by UNLV IT. The full scope of UNLV IT services can be seen at <https://www.it.unlv.edu/it-services>.

*Table 6.1.1.1 Computer Classroom Used For Construction Courses*

<b>Bldg.</b>	<b>Room No.</b>	<b>Approx. Area</b>	<b>Capacity</b>	<b>Furnishings</b>	<b>Environmental Problems</b>
Thomas Beam Engineering Complex (TBE)	B-367	821 ft <sup>2</sup>	33	Fixed Desks and moveable Chairs	None

TBE B367 is the only computer classroom available on priority basis for Civil and Construction Courses. Other computer classrooms are assigned on need basis.

- B. Discuss whether the space is shared with other academic units and who controls the assignment of the space.

Space is shared with other academic units. Classrooms are assigned by the academic scheduling department under the Office of the Registrar-The classrooms are assigned on the basis of the class size and the needs of the faculty.

6.1.1.2. Laboratories

- A. List the laboratories used for courses taught by the construction unit. Briefly describe the space, including furnishings and equipment. List the construction courses that use the space on a scheduled basis.

Table 6.1.1.2 Laboratories Used For Construction Courses

Building.	Room No.	Approx. Area	Laboratory Name	Description	Courses	Environmental Problems
Thomas Beam Engineering Complex (TBE)	A-311	1000 ft <sup>2</sup>	College-Wide Computing Laboratory	60 Computers  (These are Windows 7 computers)	Student homework and projects	None
Thomas Beam Engineering Complex (TBE)	B-367	821 ft <sup>2</sup>	CAD/Construction Instructional Classroom	Computer lab for teaching computer applications in civil engineering, construction, and mechanical engineering.  33 networked PC's	CEM 253/253L  CEM 451L/651L  CEM 452L/652L  CEM 453L/653L  CEM 750	None
Thomas Beam Engineering Complex (TBE)	B-157	570 ft <sup>2</sup>	Soil Mechanics Laboratory	Laboratory for geotechnical engineering courses and research	None at present	None
Thomas Beam Engineering Complex (TBE)	B-150	800 ft <sup>2</sup>	Materials Laboratory	Laboratory for civil and mechanical engineering mechanics of materials courses	None at present	None
Thomas Beam Engineering Complex (TBE)	B155	735 ft <sup>2</sup>	Concrete Laboratory	Laboratory for civil engineering materials testing courses and research	None at present	None
Paul McDermott Physical Education (MPE)	508	3300 ft <sup>2</sup>	Structures Laboratory	Research Laboratory	None at present	None

Under investigation are curriculum changes that would add laboratory work in CEM 250L Construction Materials and Methods utilizing the Materials Laboratory (TBE B150) and the Concrete Laboratory (TBE B155). Also under investigation is adding a laboratory component to CEM 330 Soils and Foundations in Construction to use the Soils Laboratory (TBE B157).

- B. Discuss whether the space is shared with other academic units and who controls the assignment of the space.

The Dean of the College of Engineering manages engineering laboratory space in conjunction with the University's Space Committee. The Computer Teaching Laboratory (TBE B367), which accommodates 33 students, is shared by the CEEC Dept. and ME Dept. The room is used to teach CEM courses requiring technology. The Office of Information Technology (OIT) maintains, updates, and controls TBE B367 but the space is assigned for courses by the Registrar's Office. The CEE, CEM, and ME classes have had no difficulty in having courses assigned to this Computer Teaching

Laboratory and to date courses from outside the College have not been taught there. If needed courses can also be scheduled in other computer teaching facilities on campus.

### 6.1.1.3 Offices

A. List the faculty and staff offices.

*Table 6.1.1.3 Faculty and Staff Offices*

<b>Building</b>	<b>Room No</b>	<b>Approx. Area</b>	<b>Occupant</b>	<b>Furnishings</b>
Thomas Beam Engineering Complex (TBE)	A218	374 ft <sup>2</sup>	Dr. Ahmad	Computer, Printer, book case, desk, chairs
Thomas Beam Engineering Complex (TBE)	A211	337 ft <sup>2</sup>	Gregory DeVaul staff	Computer, Printer, book case, desk, chairs
Thomas Beam Engineering Complex (TBE)	B372A	161 ft <sup>2</sup>	Larese Patillo staff	Computer, Printer, book case, desk, chairs
Thomas Beam Engineering Complex (TBE))	B374	161 ft <sup>2</sup>	Professor Opfer	Computer, Printer, book case, desk, chairs
Thomas Beam Engineering Complex (TBE)	B378D	236 ft <sup>2</sup>	Dr. Shrestha	Computer, Printer, book case, desk, chairs
Thomas Beam Engineering Complex (TBE)	B112	182 ft <sup>2</sup>	Dr. Cho	Computer, Printer, book case, desk, chairs
Thomas Beam Engineering Complex (TBE)	B370	161 ft <sup>2</sup>	Dr. Park	Computer, Printer, book case, desk, chairs

*All part time faculty teaches course between 5:30 pm and 8:15 pm. Part time teaching faculty does not have individually assigned office space. There are shared rooms available for them to use as needed.*



## **6.1.2 LIBRARY RESOURCES**

- 6.1.2.1 Describe how books, periodicals, and other reference materials may be obtained by the construction educational unit (i.e., central library, departmental library, interlibrary loan program, internet, intranet, etc.).

### **UNLV Library Services**

The University Libraries were established in 1957 and now include the main Lied Library, and other physical branch libraries: Architecture Studies, Health Sciences, Music, and the Teacher Development & Research Library. The University Libraries have 135 staff including 57 librarians. Ten of the librarians are subject liaisons who provide specialized in person, phone, email, and chat reference assistance. Liaisons and other librarians provide workshops and instructional sessions for students and faculty, including the required first year seminar for undergraduates.

The University Libraries have more than 1,200,000 bound books, 1,300,000 electronic books, 80,000 electronic and printed serials, and over 300 databases and reference resources. The collection contains over 32,000 media materials such as videos, CDs, DVDs, and audio cassettes, and many of these are accessed by users via a streaming media distribution system. The Special Collections provide unique materials relating to Las Vegas and southern Nevada history, and house the Center for Gaming Research and the Oral History Research Center.

Lied is open nearly 100 hours each week, and the branch libraries are open between 60 and 70 hours a week. Combined, all branches support over 1,775,000 in person visits annually. Online access to electronic reserves, e-books, e-journals, and online databases is available to affiliated users 24 hours a day, 7 days a week.

Lied Library has 302,000 square feet of space – equivalent to 6.9 acres, with over 28 miles of shelving on five floors. At the Lied Library, users have access to over 600 public desktop workstations for library related work, with a LabMaps software system to locate available computer workstations on all five floors of the libraries. Wireless internet access is provided throughout the five physical libraries. Across the five locations there are six instructional rooms, 27 group study rooms, 5 recording studios, and a makerspace that will be completed shortly.

The new Knowledge Production Lab provides access to specially trained staff, a design studio, scanners, camcorders, digital cameras, a large format plotter printer, and other specialized equipment. Several Mac and PC computers, with additional capabilities for 3-D modeling and other advanced video, image, audio, and data processing and analysis, are also provided. Lied Library also lends laptops and peripherals, such as projectors, VR headsets, microphones, and headsets. In addition, the Lied houses the Graduate Student Commons and tutoring services provided by the Academic Success Center.

Other innovations include a web-scale discovery service for electronic materials (Quick Search) and a robotic volume accessing facility for physical materials, called LASR (Lied Automated Storage and Retrieval). Quick Search provides discovery and access of books and e-books, journal articles, videos, and more across UNLV Libraries' databases and collections.

The Libraries manage an institutional repository that collects, preserves, and shares the intellectual output of UNLV faculty, staff, and students, as well as collaborations with other stakeholders. This repository currently holds 12,800 items and serves, on average, over 872,000 full-text downloads every year.

Student feedback and faculty input about the University Libraries is combined with borrowing, in-house use, reference consultation data, and online resource use, to assess the quality of library services and resources. Items not in the collection can be efficiently obtained via a robust interlibrary loan service, and recommendations for additions to the collection are evaluated year-round.

The library collection includes over 1.2 million bound volumes, access to more than 1.3 million e-books, nearly 80,000 journals and serials, and over 300 databases and reference sources. In addition to these subscribed and owned materials, we also have a robust interlibrary loan service and provide on-demand acquisition of many standards documents and other technical literature. All of these materials and services are available to undergraduates, graduate students, instructors, and faculty.

- 6.1.2.2 Describe where the books and periodicals related to construction are located (e.g., central library, departmental library, electronic holdings, etc.).

Many of the library materials are available in electronic format and are accessible to students on or off campus. Print materials about construction management, business, and engineering are housed in either the main library building or in the architecture-focused library branch, both located on the main campus. Students may request items at one library be delivered and held for them at the library location that is most convenient for them, or that a chapter of a book be scanned and delivered in pdf format by using an interlibrary loan request form.

- 6.1.2.3 Identify the courses taught by the construction unit that make use of library reference materials, and discuss the utilization.

Subject specialists, functional experts (GIS, poster design, etc.) and instruction specialist librarians assist with course and research assignment design, provide guest lectures and workshops, online course guides, and work with faculty and instructors to ensure the library collection is responsive to course needs. These librarians are also available for one-on-one or project team meetings with students throughout the year, and the library branches have reference and information desks to assist students and other patrons with their information needs. Most first year and transfer students are provided an orientation to library services and research techniques in EGG 101 Introductory Engineering Experience, co-taught by an instruction librarian and the engineering librarian. Students in construction courses with written and presentation requirements are encouraged to utilize library resources. Each course's online course management system

module includes a link to a subject guide webpage with recommended resources and links to contact librarians via text, chat, phone, email, or by appointment. All courses in the graduate curriculum make extensive use of the library, and the research methods course, CEE 700, has a robust course guide webpage focused on research and technical writing.

Library utilization in these courses include case studies requiring library research, course homework, course presentations, and assigned topics requiring library utilization such as reports and magazine/journal reviews. Graduate students may also take advantage of a non-credit workshop series provided by the College of Engineering with the cooperation of the library, covering topics such as library research, citation management tools, and technical writing.

### **6.1.3 INFORMATION SYSTEMS AND TECHNOLOGICAL EQUIPMENT**

- 6.1.3.1 Describe the computational equipment and software available to students to enable them to attain required learning outcomes. Describe the computational equipment and software available to faculty to support their scholarly and professional activities.

Apart from the computer and network support available in the Department-specific labs (described above), several general purpose open computer labs are maintained and supported by UNLV IT.

Specifically, OIT maintains 50 computer labs with some 1,500 computers available for academic use. The labs provide access to the technology required by faculty and students in the pursuit of teaching, learning, and research. The 50 labs maintained by UNLV IT are grouped into four kinds: (a) general use labs, (b) specialized use labs, (c) mixed instructional use labs, and (d) computer teaching labs. Information about these labs is available online <https://www.it.unlv.edu/computer-labs>. There are 8 general use labs spread across the campus, and one of them is located in TBE A311. This lab contains 60 Dell computers and 10 Macs with the following specifications:

- |   |   |                    |
|---|---|--------------------|
| - Dell T1700 SFF Precision Workstation  | - | OSX Sierra         |
| - 64-bit Intel Xeon Quad Core @ 3.6 GHz | - | (10.12)            |
| - 16 GB RAM                             | - | 27" retina display |
| - 512 GB Solid State Drive              | - | 512 GB SSD         |
| - Nvidia Quadro K620 2GB Video Adapter  | - | 8GB RAM            |
| - Gigabit Intel Network Adapter         | - | Core i5 (@3.2 Ghz) |



All 70 computers are securely connected to high speed Internet. The frequently used software includes Adobe Acrobat Professional, Adobe Design Premium, Autodesk, Mathematica, Matlab, Ubuntu VM, Microsoft Office, SPSS, and Visual Studio. Although this computer lab is located in the Thomas Beam Engineering Building and is predominantly used by Engineering College students, it is available to all currently enrolled UNLV students. This lab originated over a decade ago on College of Engineering funding, and it is maintained through the use of the campus wide student technology fee on a four-year computer replacement cycle. The fee is controlled by a student technology advisory board, consisting of student representatives from UNLV's student government, the College of Engineering and other colleges, and staff from UNLV IT.

All faculty members (academic and administrative) and student workers have individual work station computers in their offices. UNLV IT has a policy of replacing computer equipment for faculty and staff every three years or as needed. These computers get maintenance support both from the systems administrator and UNLV IT.

6.1.3.2 For courses delivered by alternate methods, describe the type of technical support given the students.

There are no courses delivered using alternate methods. There are some courses that are only offered on-line. UNLV uses Webcampus (CANVAS) as learning management system to deliver these courses. Office of on-line Education provides technical support for developing on-line courses that includes but is not limited to video recording, animation, and content development. Office also provides support and resources for students.

## 7. FINANCIAL RESOURCES

### 7.1 Requirements

#### 7.1.1. BUDGETED FUNDS

- 7.1.1.1 Indicate the amount and percentage of operating revenue and expenditures for the construction educational unit and units within the institution that are comparable to the construction educational unit. In addition, explain how these units are similar in size and function.

Expenses for the CEM Program are included in the Department of Civil & Environmental Engineering and Construction's State Budget. There is no separate State line item for the CEM Program. The funds and expenditures are taken from Program and College-level information.

*Table 7.1.1.1 Construction Educational Unit and Comparable Units Operating Revenue and Expenditures for the Prior Fiscal Year\* - Period covered (7/1/18 – 6/30/19)*

Revenue Source	Revenue Amount \$	% of Total
Institutional Funds / State Funds	\$3,284,028	86.2%
Special Course Fees & Differential Fees	\$53,396	1.4%
Self-Supporting Funds	\$84,265	2.2%
Part-Time Instructors / State Funds	\$89,442	2.3%
Graduate Assist/TAs / State Funds (Grad Coll)	\$284,014	7.5%
College Diff Fees	\$13,298	0.04%
<b>TOTAL REVENUE</b>	<b>\$3,808,443</b>	<b>100%</b>
Expenditure Type	Expenditure Amount \$	% of Total
Salaries		
Faculty	\$2,3022,545	60.9%
Professional, Classified Staff & Wages	\$269,005	7.1%
Part Time Instructors	\$85,284	2.2%
Graduate Assistant/TAs	\$215,500	5.7%
Fringe Benefits	\$710,120	18.7%
<i>Subtotal Salaries</i>	<b>\$3,602,454</b>	<b>94.6%</b>
Operating		
Supplies	\$13,067	0.3%
Educational Materials	\$10,466	0.3%
Telephone/Internet	\$7,121	0.2%
Equipment	\$47,485	1.2%
Travel	\$15,551	0.4%
Memberships, Accreditation Fees, Repairs	\$14,967	0.4%
TA's Tuition and Fees	\$52,282	1.4%
Hosting	\$7,311	0.2%
Student's Senior Design Reimbursements, Stu. organizations support.	\$12,252	0.3%
<i>Subtotal Operating</i>	<b>\$180,508</b>	<b>4.7%</b>
Ending Balance rolled over to FY20	\$25,481	0.7%
<b>TOTAL EXPENDITURES</b>	<b>\$3,808,443</b>	<b>100%</b>

*Comparable Units (Mechanical Engineering) Operating Revenue and Expenditures for the Prior Fiscal Year\* - Period covered (7/1/18 – 6/30/19)*

Revenue Source	Revenue Amount \$	% of Total
Institutional Funds / State Funds	3,560,625	88.0%
Special Course Fees & Differential Fees	99,595	2.5%
Self-Supporting Funds	299,805	1.8%
Part-Time Instructors / State Funds	21,506	0.5%
Graduate Assist/TAs / State Funds (Grad Coll)	267,750	6.6%
College Diff Fees	23,418	0.6%
<b>TOTAL REVENUE</b>		<b>100%</b>
Expenditure Type	Expenditure Amount \$	% of Total
Salaries		
Faculty	2,718,149	67.1%
Professional, Classified Staff & Wages	91,522	2.3%
Part Time Instructors	21,506	0.5%
Graduate Assistant/TAs	267,750	6.6%
Fringe Benefits	721,000	17.8%
<i>Subtotal Salaries</i>	<b>3,819,927</b>	<b>94.3%</b>
Operating		
Supplies	21,086	0.5%
Educational Materials	28,736	0.7%
Telephone/Internet	14,223	0.4%
Equipment	32,280	0.8%
Travel	8,382	0.2%
Memberships, Accreditation Fees, Repairs	1,385	0.03%
TA's Tuition and Fees	34,235	0.9%
Hosting	2,732	0.07%
Student's Senior Design Reimbursements, Stu. organizations support.	23,4185	0.6%
<i>Subtotal Operating</i>	<b>166,477</b>	<b>4.1%</b>
Ending Balance rolled over to FY20	61,295	1.5%
<b>TOTAL EXPENDITURES</b>	<b>4,047,699</b>	<b>100%</b>

Mechanical Engineering (ME) is used as comparable unit to Civil and Environmental Engineering and Construction (CEEC). Currently both departments have comparable faculty size 17 for ME vs 18 for CEEC. However, undergraduate student enrollment is significantly different 346 for CEEC vs 586 for ME.

- 7.1.1.2 Indicate the amount and percentage of operating revenue and expenditures allocated for the construction degree program and, if applicable, other degree program contained within the educational unit.

Budget allocated to the CEEC Department is for both degree programs. There is no separate allocation for the construction degree program.

*Table 7.1.1.2 Degree Programs Operating Revenue and Expenditures for the Prior Fiscal Year\**

Same as in Table 7.1.1.1

- 7.1.1.3 Detail how projected resources will be adequate to ensure the capacity of the degree program to achieve its planned growth, future goals, and objectives.

Allocated budget is adequate to run the program. Current class size is small (8-20 students in most courses) and program will be able to accommodate growth (up doubling the current program size) using existing faculty and resources.

## **7.1.2 NONRECURRING FUNDS**

- 7.1.2.1 Identify the source, amount, and use of nonrecurring funds (soft monies, annual gifts, donations, etc.) for the degree program.

Nonrecurring funds are provided by returned indirect costs from research projects and gift funds from donors. This amount varies by year depending upon the returned overhead generated by the department and availability of gift funds. Currently, CEEC returned overhead account balance of \$48,405. Construction Gift account also has a balance of 67,103 as of November 1, 2019.

- 7.1.2.2 Detail how any nonrecurring funds have been used in the last three fiscal years.

These funds have been used to support faculty travel to attend conferences and trainings. Funds are also used to support student participation in student competitions and conferences. Funds are also used to supplement start-up funds for new faculty hires.

## **8. INDUSTRY, ALUMNI AND PUBLIC RELATIONS**

### **8.1 Requirements**

#### **8.1.1 SUPPORT FROM INDUSTRY**

- 8.1.1.1 Provide evidence that the construction industry advisory committee is representative of potential employers of graduates of the degree program and other industry professionals.

The CEEC Advisory Board has an open membership policy, i.e. there is not a limited number of seats available. Each member is asked to contribute \$500/year to the program. The board is organized into four committees – Communication, Curriculum, Fund Raising, and Experiential. The chairs of these committees, board chair, and board vice-chair make up the Executive Committee. The Experiential Committee has formed subcommittees because of the nature and scope of their effort. The board chair also serves on the College of Engineering Advisory Board.

The CEEC Advisory Board meets once per quarter; committees meet as needed, usually on a more frequent basis. The locations for these meetings vary, but the board has recently been holding its meetings at local high schools to try expand our outreach efforts.

Advisory board helps in meeting the needs of the department, its students, and the industry by:

- Being the voice of the industry for the department and the college
- Being an advocate for the best interests of the construction management students in order to produce outstanding graduates who can be innovative, effective, and productive leaders in the construction industry
- Supporting the needs of the department and its students
- Advising the department on curriculum, course content, and faculty development in order to ensure that students receive an education that prepares them to meet the ever-changing demands of the industry
- Review student learning assessment data to help guide curriculum and improve student learning

Specifically, the Advisory Board has:

- Provided a review of construction management student learning objective data and suggested improvements.
- They serve as jury members responsible for evaluating student presentations as a part of their Senior Design.
- They provide guidance in long-term planning relative to enhancement of the program to meet the changing need of the industry.
- They assist the department in raising funds to support department initiatives.



- They provide summer internships for students
- They serve as guest speakers or faculty members in individual courses.

The following table shows current membership of advisory board

<b>Last Name</b>	<b>Affiliation</b>	<b>Organization Type</b>
	Geotek	Geotechnical Engineering and Inspection
	PENTA Bldggroup.Com	Design and Construction
	CM Works	Construction Administration Firm
	BMC	General Contractor
	Korte Company	Design Build Company
	Atkins	Engineering Firm
	UNLV	University
	Nova Geotech	Geotechnical Engineering and Inspection
	C-A Group	Engineering Company
	Clifton Larson Allen	Accounting/Finance
	Clark County Public Works	Government – Public Works
	Atkins	Engineering Company
	UNLV	University
	MJF	Engineering Company
	McCarthy	General Contractor
	Thor Construction	General Contractor
	Southwest Gas	Utility - Gas
	UNLV	University
	Clark County Building Dept	Government - Building
	WSP	Engineering Firm
	RTC	Government - Transportation
	WALT P Moore	Engineering Firm
	Wright Engineers	Engineering Firm
	DCBG	Construction Company
	Regional Flood Control	Government – Flood Control
	NDOT	Government - Transportation

- 8.1.1.2 Provide evidence that the construction industry advisory committee meets at least once a year for the purpose of advising and assisting the development and enhancement of the degree program.

Industry Advisory Board (IAB) for the CEEC program (CEEC Advisory Board) meets four times a calendar year, February, May, August, and November.

The CEEC Advisory Board has been a tremendous help to both academic programs. Here are just a few activities other than financial contributions:

- a. Internships – Board members are spearheading an effort to provide all CEEC students internship opportunities with local companies. Just in the past year, this effort has approached saturation, i.e. every qualified student that wants an internship has one. This is especially true for Construction Management students where internship opportunities significantly exceed available students.
- b. Experience Committee Outreach Program – Advisory Board Member, CMWorks, leads our effort to reach out to high schools and other schools through career fairs, panels and classroom presentations. We have a group of both young and more seasoned professionals that are diverse who volunteer at the schools. During the programs our volunteers discuss potential careers in civil engineering, environmental engineering and construction management and just about any related field in an effort to reach students. They also discuss UNLV and the outstanding programs available in Southern Nevada. Finally, we obtain their contact information and provide it to UNLV for targeted recruitment which could include mailers, meetings, tours, scholarships, other financial aid, etc. We are meeting with other professional organizations to leverage our outreach and team up on other efforts such as Construction Career day through Nevada Contractors Association which 4,000 high school and middle schoolers attended.
- c. Faculty Socials – The Advisory Board has held faculty socials every year to promote the faculty-industry interaction. These socials have helped our integration process tremendously.
- d. Golf Tournament – The Advisory Board organizes the Dennis Waibel Memorial Golf tournament (Mr. Waibel was a former Advisory Board member) each year. The November 2018 tournament included over 100 participants and raised over \$12,000 for the department.
- e. Course Review – Advisory Board Member, from CA working with other advisory board member held a comprehensive review of CEM courses and submitted a report on April 10, 2018. They reviewed curriculum map, degree sheet, course syllabi and CV's of Instructors. They provided very useful feedback on course content and suggestions for modifications. The review also served as the basis for future discussions on the overall curriculum content and how it meets with industry needs (or does not). Prior curriculum review by Advisory board was done in November 2013.

- f. Communications committee – Advisory Board Member, NDOT, has been providing newsletters, twitter, Facebook and other avenues of conveying the work our Board is doing to encourage further participation and community support.

8.1.1.3 Provide minutes of each construction industry advisory committee meeting.

Minutes are available on google drive.

### 8.1.2 SUPPORT FOR INDUSTRY

Demonstrate that the degree program maintains continuous liaison with the various constituencies it serves via active participation by faculty in associations and other professional organizations for the purpose of serving the construction industry.

Faculty serve on various organizations related to the construction industry. The following table provides a sampling:

Name	Organizations
Sajjad Ahmad	ASCE; Panel Member NCHRP; Panel Reviewer for NSF; Committee chair for several ASCE committees.
Pramen P. Shrestha	Member, TRB Project Delivery Committee and Construction Industry Institute Member of ASCE and CRC. Panel reviewer of NCHRP
Neil Opfer	Chair, National BIM Standard Planning Committee, CRC, ASCE
Jin Ouk Choi	Lean Construction Institute member, advisory committee for Korea Institute of Construction Technology
Jee Woong Park	Member of ASCE, TRB, ACI, MCA,

Construction faculty conducts several seminars, trainings, or short courses for construction industry.

<b>Dates</b>	<b>Description</b>	<b>No. of Participants</b>	<b>Faculty Participants</b>
Fall & Spring 2015	UNLV CEEC Fundamentals of Engineering FE Exam Review (Construction), Las Vegas, Nevada	16	Shrestha
Fall 2011 to Fall 2014	PE Construction exam review for ASCE Young Member forum (5 times)	50	Shrestha
Spring 2018	Certified Earned Value Professional Training, AACE International, Las Vegas, Nevada		Opfer
Fall 2014-Spring 17	PE exam review for ASCE Young Member forum (5 times)	90	Ahmad
Fall 2015-Fall 2018	Laboratory tours of school students during construction career day on UNLV campus	800 students per year	Ahmad; Shrestha; Opfer; Choi; Park
Fall 2019	OSHA 10-Hour General Industry Safety Course (Clark County School District - ECTA), Las Vegas, Nevada	21	Opfer
Fall 2012	Certified Professional Scheduler & Planner Exam Training, AACE International, Las Vegas, Nevada.	10	Opfer
Summer 2019	OSHA 30-Hour Construction Safety Course (Clark County School District - Construction-Area Faculty) (June 2012), Las Vegas, Nevada	12	Opfer
Spring 2012	Certified Cost Engineer Exam Training, AACE International, Las Vegas, Nevada.	10	Opfer
Spring 2013	OSHA 10-Hour Construction Safety Course (January 2012), Santa Barbara, California.	15	Opfer

### **8.1.3 STUDENT-INDUSTRY RELATIONS**

- 8.1.3.1 Demonstrate that the degree program actively encourages and facilitates participation of students in activities of construction-related organizations, internships, and cooperative education programs.

The department supports several student organizations affiliated with the construction industry including American Concrete Institute, Associated General Contractors, National Association of Home Builders, and American Society of Civil Engineers. College of Engineering has an Internship coordinator at Engineering Career Services who helps students in finding internships and employment. Our internship placement rate has been 100% in past two years.

- 8.1.3.2 Demonstrate that all students (traditional and distance education) have access to information about internships and cooperative education programs and activities of construction-related organizations in their local area.

The information about the internship starts with advising. The requirement is on our advising forms, and it is emphasized at orientation and in meeting with faculty advisers. The department facilitates numerous opportunities for companies to recruit on campus and hosts a career fair.

Engineering Career Services was created in 2015 as a branch of the central office of UNLV Career Services. Hired to specifically work to help place engineering students into "meaningful work experiences", this team immediately created its own Engineering Job Board where engineering firms could post openings for either internships or jobs. This job board is still the first place engineering students look for openings, [www.unlv.edu/engineering/jobs](http://www.unlv.edu/engineering/jobs). Since the fall of 2015, over 850 students have found internships and 600+ have found permanent work from the board.

In addition, workshops are available teaching students a variety of career enhancing skills, such as "How to Write a Better Resume", "How to Write a Cover Letter", "How to Interview and Get the Job", "How to Negotiate Your Salary" and more. Since they began in 2015, 125 workshops have been held with an average attendance of 40 students in attendance.

Employers were and continue to be invited to the UNLV campus to host Information Sessions, an hour-long segment educating students about the company and the roles/positions it has available. Employers began offering to conduct their own workshops, such as "Mock Interviews & Networking". They also work with the College to offer "Employer Treks", an invitation from the employer to the students to visit the company location, tour and hear from engineers that work there.

Hiring Events, such as a STEM related job fair was created in 2016 with 45 employers. That grew in 2017 to 85 employers and in 2018 to 116 employers. Over 750 students attended the job fair in fall, 2018. This year, the STEM job fair will merge into the UNLV campus-wide career fair, the "Southern Nevada Career Fair" that will be hosted October 9th, 2019 at the Thomas & Mack with approximately 200 employers.

## **8.1.4 ALUMNI RELATIONS AND FEEDBACK**

- 8.1.4.1 Demonstrate that the degree program maintains a current registry of alumni and contact with them to seek feedback in its improvement process.

The department maintains contact with our alumni via email, and social media (Linkedin and Facebook). We also conduct an alumni survey every 3 years to get feedback on our program. Alumni are also invited to our senior design event, and homecoming social event. Several members of IAB are alums and provide feedback as part of our improvement process. Recently we added a

few young members to diversify the membership of advisory board and to improve feedback from recent graduates.

- 8.1.4.2 Demonstrate that the degree program engages the alumni in activities such as a formal advisory board, student career advising, potential employment, curriculum review and development, fund raising, and continuing education.

Some IAB members are Construction Management alums. Companies that come to campus to recruit students normally include some recent graduates of the Construction Management program. Curricular review and fund raising are part of IAB mission. Additionally, the department chair typically works with alums to connect with local contractors and consulting companies for fundraising efforts. The department is in the process of starting a certificate in construction management as part of its continuing education program through a HELP (Homebuilding Education Leadership Program) grant from National Housing Endowment. The advisory board will be engaged in this process.

#### **8.1.5PUBLIC DISCLOSURES**

- 8.1.5.1 Demonstrate that the institution broadly and accurately publishes the objectives of the degree program, admission requirements, degree program assessment measures employed, the information obtained through these assessment measures and actions taken as a result of the feedback, student achievement, the rate and types of employment of graduates, and any data supporting the qualitative claims made by the degree program.

This information can be found at <https://www.unlv.edu/ceec>:

*Follow the link to “Construction Management Program Assessment Information”.*

## 9. ACADEMIC QUALITY PLANNING PROCESS AND OUTCOME ASSESSMENT

### 9.1 Requirements

If terminology of the assessment process varies from the definitions found in Section 1 of the Standards contained in ACCE Document 103, provide a glossary of compatible terminology.

#### 9.1.1 CONTINUOUS IMPROVEMENT

Provide a copy of the Program Quality Improvement Plan in Appendix C of Volume II including the following:

9.1.1.1 Strategic Plan for the educational unit

9.1.1.2 Assessment Plan for the degree program

9.1.1.3 Assessment Implementation Plan for the degree program

Copy of program QIP is provided in Appendix C of Volume II.

#### 9.1.2 EDUCATIONAL UNIT STRATEGIC PLAN

Describe the educational unit's Strategic Plan for the continuous improvement of the degree program, and specifically:

Strategic plan is developed at College of Engineering level. Most recent version is available at

[https://www.unlv.edu/sites/default/files/page\\_files/27/StrategicPlan-2016.pdf](https://www.unlv.edu/sites/default/files/page_files/27/StrategicPlan-2016.pdf)

All units in the college follow same shared goals and indicators of success.

9.1.2.1 Describe the systematic and sustained effort to enable the degree program to fulfill its mission.

Students receive services from tutoring, advising and career centers to ensure that they are on track towards completing their degree. All students are assigned faculty mentors. Virtually every student gets internship experience. Guest speakers are invited and students visit construction projects as part of their curriculum. Students have the option to join several student chapters and participate in competitions. A system is in place to ensure that Student Learning Outcomes are achieved. Several data points are used to receive feedback from students (teaching evaluations, senior exist surveys) to improve degree program and fulfill its mission.

9.1.2.2 Describe the internal status of the degree program resources as well as the external factors that influence the operation of the degree program.

The degree program is supported by state funding that is a combination of tuition and state funding. The resources provide funding for faculty, staff, operations and the support of classrooms and various support functions provided by the university. Considering the size of program, current resources allocation is healthy. External factors that influence the degree program are the economy and student enrollment. Program was negatively impacted during previous economic downturn (2008-2012) and enrollment declined. However, program has recovered with gradually increasing student enrollment.

- 9.1.2.3 Demonstrate that the Strategic Plan is updated periodically and that it represents the collective input from all of the degree program constituencies.

Most recent version of strategic plan was developed during 2015-2016 academic over and approved in March 2016. All stakeholders (faculty, students, alumni, employers, Industrial Advisory Board members, and Clark county schools district) participated in the process.

### **9.1.3 DEGREE PROGRAM ASSESSMENT PLAN**

Provide the educational unit's comprehensive Assessment Plan for the continuous improvement of the degree program with documented results from all systematically collected information, and:

- 9.1.3.1 Describe the Mission Statement of the degree program.

To prepares students for professional practice as a construction manager.

- 9.1.3.2 Describe the Degree Program Objectives (to be evaluated for clarity and ability to permit assessment of achievement).

- Graduates will meet the expectations of employers of construction managers in all areas of construction practice
- Graduates will be capable of advancement in the construction profession
- Qualified graduates will be capable of pursuing advanced study

- 9.1.3.3 Describe the Program Learning Outcomes and demonstrate that they are regularly formulated, evaluated, and reviewed with the appropriate participation of faculty, students, industry advisors, and other pertinent parties.

Program Learning Outcomes are same as Student Learning Outcomes. Upon graduation student should be able to:

- SLO 1- Create written communications appropriate to the construction discipline.  
SLO 2- Create oral presentations appropriate to the construction discipline.



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

These outcomes were reviewed and adopted in Fall 2017. These SLO's are regularly assessed through direct and indirect measures. Faculty annually reviews these outcomes based on input from students (student performance, course evaluation, AIC exam results, senior exit surveys) and stakeholders (alumni and employer surveys, and advisory board input).

Describe the assessment tools used to measure Degree Program Objectives and Program Learning Outcomes as stated in 9.1.3.2 and 9.1.3.3 above, and, describe the frequency for using the tools, describe the procedures for data collection.

The Civil and Environmental Engineering and Construction faculty has established and follows a robust process for evaluating degree Program Objectives and the Program Learning Outcomes, and implementing changes toward our goal of continuous improvement. A variety of assessment tools gather information from students, faculty, alumni, and employers. Some provide direct measurements of student learning outcomes and others provide stakeholder opinions on student learning outcomes, while some provide more general program assessment information. The collected data are reviewed every year in a dedicated faculty retreat, and suggestions for improvement or changes are made and voted on by the faculty.

A summary of assessment tools and data collection is provided in Table 1.

**Table 1. Summary of assessment tools.**

<b>External Assessments Tools</b>					
<b>Label</b>	<b>Description</b>	<b>Frequency</b>	<b>Type of Assessment</b>	<b>Used to Measure Achievement of</b>	<b>Procedure for data collection</b>
A1	AIC Exam Results	Once per Year	Direct	Selected SLO's	Reported by AIC
A2	Employer Surveys	Every Three Years	Indirect	SLO and Program Objectives	On-line Survey
A3	Alumni Surveys	Every Three Years	Indirect	SLO and Program Objectives	On-line Survey
A4	Program Review by Advisory Board	Every Three Years	Indirect	SLO and Program Objectives	Reported by IAB
<b>Internal Assessments Tools</b>					
<b>Section</b>	<b>Description</b>	<b>Frequency</b>	<b>Type of Assessment</b>	<b>Used to Measure Achievement of</b>	<b>Procedure for data collection</b>
A5	Faculty Evaluation of Student Learning Outcomes	Every Semester	Direct	SLO	Collected and Reported by Instructor
A6	Graduating Senior Exit Surveys	Every Semester	Indirect	SLO and Program Objectives	On-line Survey
A7	Student Evaluation of all Class Instructors	Every Semester	Indirect	Teaching quality and SLO	On-line Survey
A8-1	Program Review (Major) by faculty	Every Three Years	Summative Assessment	SLO and Program Objectives	Report by faculty committee
A8-2	Program Review (Minor) for Catalog Updates	Every Year	Summative Assessment	SLO and Program Objectives	Report by faculty committee

9.1.3.4 Describe the Performance Criteria used to measure the achievement of the Degree Program Objectives and Program Learning Outcomes as stated in 9.1.3.2 and 9.1.3.3 above.

<b>Assessment Tool</b>	<b>Performance Criteria</b>	<b>Used to Measure Achievement of</b>
AIC Exam Results	Pass rate equal to or better than national average	Selected SLO's
Employer Surveys	Score of 3.5/5.0	SLO's; program quality; program objectives
Alumni Surveys	Score of 3.5/5.0	SLO's; program quality; program objectives
Graduating Senior Exit Surveys	Score of 3.5/5.0	SLO's; teaching quality, program quality; program objectives
Faculty Evaluation of Student Learning Outcomes	Performance threshold set by individual faculty	SLO's
Student Evaluation of all Class Instructors	Score of 3.5/5.0	SLO's, teaching quality, program quality
Program Review by Advisory Board	Review and Approval	SLO's; curriculum, program quality; program objectives
Program Review by faculty	Meeting or exceeding above stated criteria	SLO's; curriculum, program quality; program objectives

9.1.3.5 Describe the Evaluation Methodology used for data collection.

All collected data are converted to numeric scores. This is compared with established performance criteria to assess if performance targets are met or not. Results are used for decision making to improve the program quality, objectives, and SLO's.

#### **9.1.4 ASSESSMENT IMPLEMENTATION PLAN**

Describe the educational unit's Assessment Implementation Plan for the continuous improvement of the degree program and provide evidence that the degree program is making progress in achieving its mission, objectives, and learning outcomes and that it takes the outcomes assessment results into consideration in degree program development.

Specifically demonstrate that:

- 9.1.4.1 The degree program is conducting a comprehensive assessment of its goals and Program Learning Outcomes, and collecting data at least annually.
- 9.1.4.2 The results of each assessment cycle are documented in a systematic manner and that a complete assessment cycle of all Student Learning Outcomes is conducted at least once every three years.
- 9.1.4.3 Evaluation of the Degree Program Objectives and Program Learning Outcomes are being compared to the stated performance criteria to determine whether stated objectives and Program Learning Outcomes were achieved and if there is a validated need for improvement in any areas.
- 9.1.4.4 After each comprehensive assessment cycle, the entire process is being reviewed and updated with plans for improvement including any revisions to the degree program's assessment plan.

## **Assessment Implementation plan for Quality Improvement**

The Civil and Environmental Engineering and Construction faculty has established and follows a robust process for evaluating the academic program and implementing changes toward our goal of continuous improvement. A variety of assessment tools gather information from students, faculty, alumni, and employers. Some provide direct measurements of student outcomes and others provide stakeholder opinions on student outcomes, while some provide more general program assessment information. The student outcome assessments and data collected from alumni, industry, and stakeholders are reviewed every year in a dedicated faculty retreat, and suggestions for improvement or changes are made and voted on by the faculty.

### **Assessment Tools and Data Collection**

The following assessment tools are used:

***Course examinations and assignments.*** Most Construction courses utilize homework problems, quiz questions, and exam problems to assess student performance. These same measures link directly to student learning outcomes.

***Student term projects.*** Student projects are an important component of many courses and usually culminate with a written report, oral presentation, or both. Most projects require independent thinking to formulate a problem, identify possible approaches or solutions to the problem, and gather information to complete the project.

***Course evaluations.*** Students complete evaluations for each course near the end of the semester. These evaluations allow direct student input on instructor effectiveness and student learning outcomes, and also allow students to provide written comments. These results are provided to instructors at the end of the semester. The Department Chair uses the results to provide broad feedback to all faculty members and as input to annual faculty evaluations. In addition, the Department Chair uses these data to identify faculty who need teaching training, additional instruction support, or change in teaching strategies.

***Senior Exit Surveys.*** Each student is asked to complete (anonymously) a Senior Exit Survey that covers a wide range of topics including Student Learning Outcomes and Program Objectives. These surveys are completed on-line near the end of their final semester (usually within 1 month of graduation). Results from these surveys are shared with faculty and used, along with other assessment data, for learning outcome assessment and program improvement.

***Senior Exit Interviews.*** The Department Chair interviews each graduating senior within a few weeks of graduation. These interviews usually last 30 minutes and consist partially of career mentoring, but primarily provide students an opportunity to give direct input to the Department Chair. Students are asked to comment on facilities, support services (tutoring, advising, and career), instructors, courses and any issues students may have encountered in the program and other areas of the University. Student inputs on Program Objectives and SLO's are also solicited during this interview.

***Alumni Surveys.*** An online survey is distributed to alumni to obtain input on the program based upon their experiences in the profession. Submissions are anonymous. Alumni Surveys are conducted every three years.

**Employer Surveys.** An online survey is distributed to employers to obtain input based upon their experiences with graduates of the program. Submissions are anonymous. Employer surveys are conducted every three years.

Results from both Alumni and Employer Surveys are shared with faculty and used, along with other data, for assessment of learning outcomes and program educational objectives.

**AIC Exam.** All Construction majors are **required** to take the AIC Exam prior to graduation. Detailed results for each test taker are provided by AIC every year. The CEEC department has a course (CEM 455) dedicated to reviewing major topics for the exam. Students are required to make a good faith attempt for the exam; it is not required to pass the exam to graduate.

**CEEC Industrial Advisory Committee.** The CEEC Advisory Board, comprised of alumni and employers in civil engineering and construction, meets quarterly and provides general input about the program and its direction. Additionally, the Advisory Board Curriculum Committee meets independently and provides specific input on curriculum matters. The Advisory Board completed a comprehensive review of all construction courses in Spring 2018 and provided input to the faculty for consideration. This review also served to increase Advisory Board awareness of the curriculum content to improve their ability to provide useful input. Advisory board also reviewed program objective in Spring of 2019.

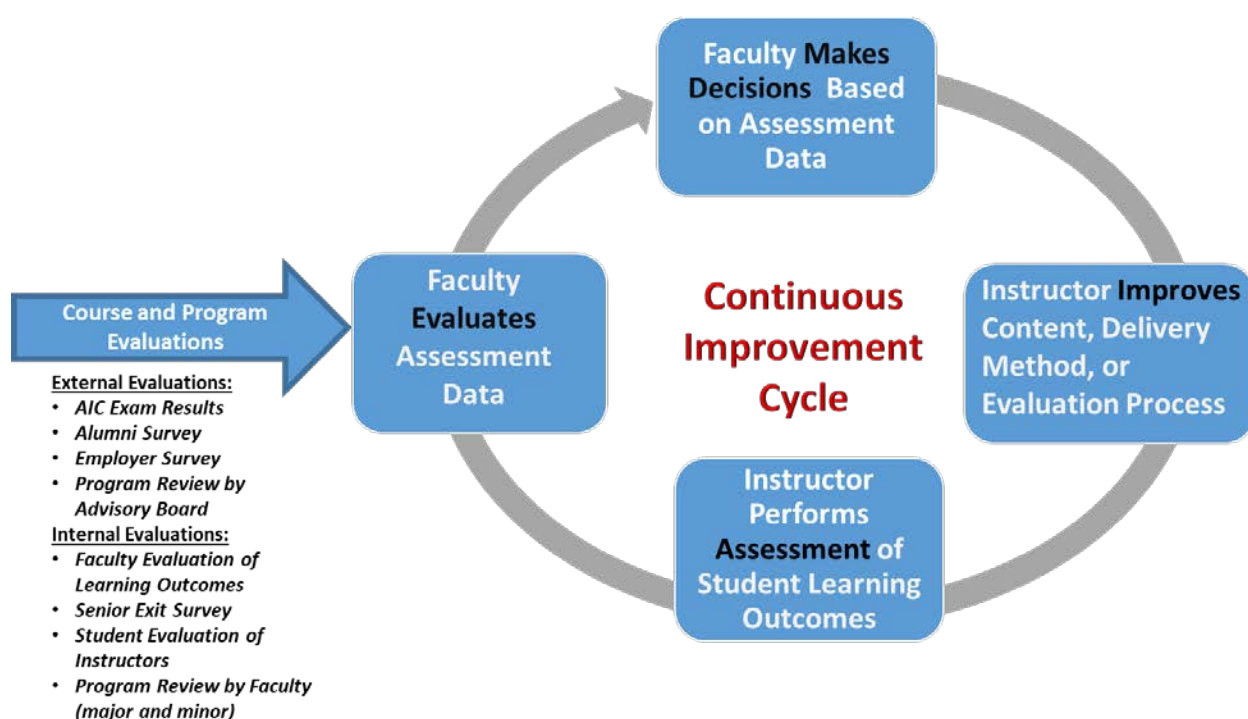
Additionally, graduation rates and student retention rates are carefully followed. While these are not direct measures of student outcomes, they are extremely important to the university’s goal of increasing retention, and to the long-term health of the department, as they influence future university allocation of resources and faculty positions. A summary of assessment tools is shown in Table 1.

**Table 1. Summary of assessment tools.**

<b>External Assessments Tools</b>		
<b>Label</b>	<b>Description</b>	<b>Frequency</b>
A1	AIC Exam Results	Once per Year
A2	Employer Surveys	Every Three Years
A3	Alumni Surveys	Every Three Years
A4	Program Review by Advisory Board	Every Three Years
<b>Internal Assessments</b>		
<b>Section</b>	<b>Description</b>	<b>Frequency</b>
A5	Faculty Evaluation of Student Learning Outcomes	Every Semester
A6	Graduating Senior Exit Surveys	Every Semester
A7	Student Evaluation of all Class Instructors	Every Semester
A8-1	Program Review (Major) by faculty	Every Three Years
A8-2	Program Review (Minor) for Catalog Updates	Every Year

External assessments (A1-A4) are gathered from alumni and employers (through widely-distributed surveys), the CEEC Advisory Board, and AIC exam results. All collected assessment data are evaluated by the department’s Undergraduate Curriculum and Assessment Committee (UCAC). The UCAC makes recommendations to the faculty based upon those assessments. Our Advisory Board meets quarterly with the Department Chair and provides direct feedback through that channel. The Department Chair or the UCAC (as appropriate) recommends potential changes to the faculty. Faculty discusses and votes on proposed changes. The Department Chair also solicits input from the Advisory Board as issues arise where their perspective can be valuable. The educational outcome assessment and continuous improvement cycle is shown in Figure 1.

### Continuous Improvement Cycle

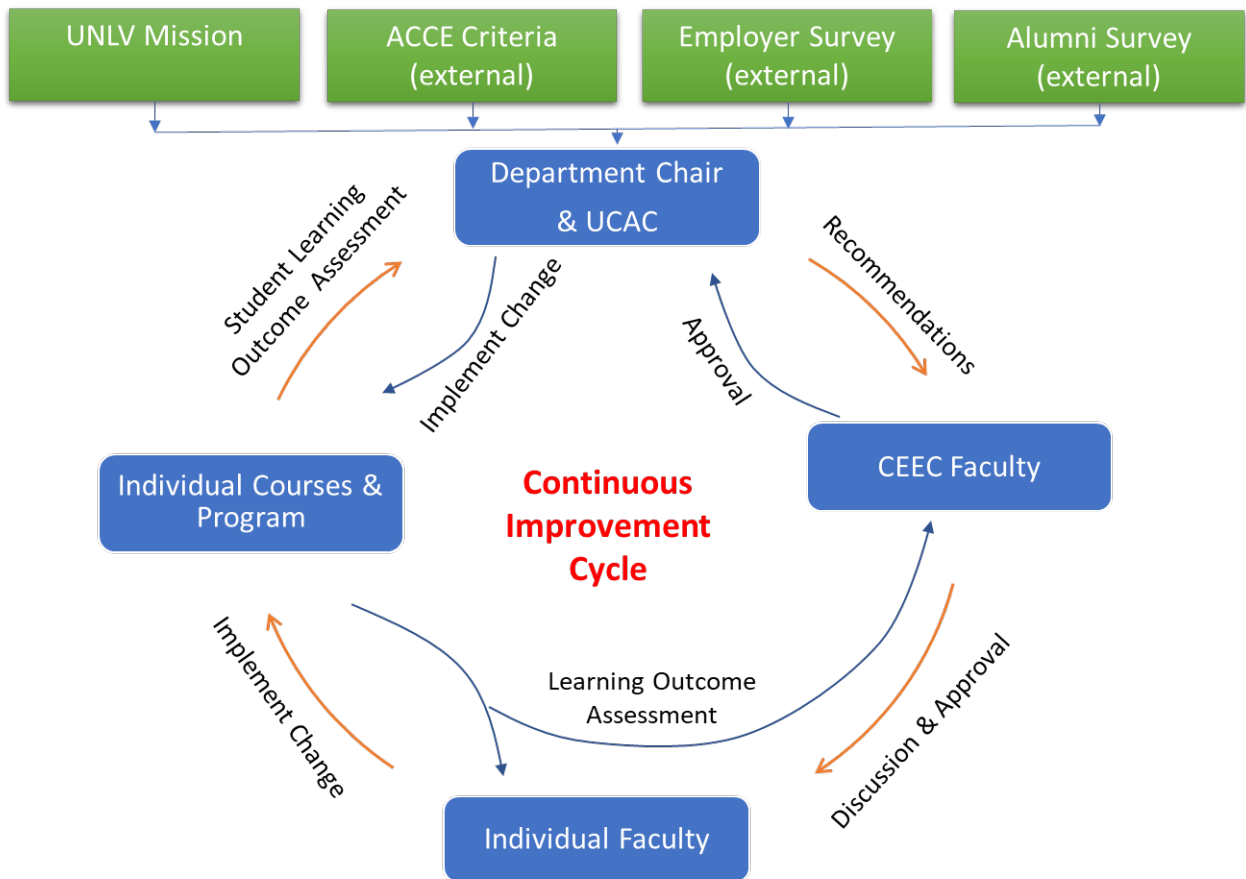


**Figure 1. Course and program assessments and continuous improvement cycle.**

Internal assessments (A5-A8) are also integral to our continuous Quality Improvement Process. Information is gathered from graduating seniors, who are at a point to provide particularly insightful input, through a formal exit survey and one-on-one exit interviews with the Department Chair. While some of the input is duplicative, the different characteristics of the two instruments provide robust feedback and input for improvement. During the last weeks of each semester, students evaluate every offered course. These evaluations cover instructor performance in areas related to both classroom performance and levels of learning outcome attainment. Additionally, class instructors provide formal assessment of Student Outcomes through several approaches including, designated homework and examination problems, in-class assignments, and class projects and reports.

Integration of inputs from a wide range of internal and external sources provides robust assessment of the CM program and outcomes. These assessments inform the faculty so they can make an appropriate judgment about curriculum, teaching methods, course content, and changes necessary to improve student learning and the quality of the program.

Flows of program assessment information and subsequent continuous improvement feedback are illustrated in Figure 2. The Department Chair or UCAC, as appropriate, initiates consultation with faculty, and changes are implemented either through individual instructors at course level, or directly at the curriculum/program level. Progress as a result of changes made is monitored to ensure improvements in the learning outcomes.



**Figure 2. Program assessment information flows and continuous improvement cycle.**



## Evaluation of Collected Data and Decision Making

Direct and indirect assessment measures are employed to regularly evaluate our success in achieving these learning outcomes. These assessments collect information from all of our constituents – current students, graduates, alumni, employers, and interested community members. These data are evaluated by the CM faculty with help from key Advisory Board members to identify curricular and program changes to better attain the learning outcomes. Discussions of potential programmatic changes are initiated by CM faculty, presented to the Department’s Undergraduate committee, and then voted on by the entire CEEC faculty. Once approved by the faculty, changes must also be approved by College and University Curriculum Committees prior to implementation.

This Quality Improvement Plan is a continuous process and assessment results are analyzed immediately upon receipt. However, organized annual evaluations of all available assessment results are conducted during a daylong faculty retreat to ensure that the process leads to a continuously improving program.

### **4. Program Assessment Measures and Results**

A range of instruments are employed to assess how well our program accomplishes the learning objective and program outcomes. The measures employed and the schedule of their deployment is as follows:

<b>Assessment Instrument</b>	<b>Learning Outcomes</b>	<b>Person(s) Responsible</b>	<b>Data Collection</b>
American Institute of Constructors’ Associated Constructor Level I Exam	All	CEM 455 Instructor	Spring Semester
Alumni & Employer Surveys	All	Associate Dean College of Engineering	Every 3 years. Most recent survey done in 2018
Student Exit Interviews & Surveys	All	Department Chair	Graduation Semester
Course and Instructor evaluations done by students	All	Department Chair	Every Course in every semester

Additional assessments are employed as appropriate. The most recent data and assessments from each instrument are provided below.

#### **a. American Institute of Constructors’ Associated Constructor Level I Exam**

Construction Management Seniors takes the American Institute of Constructors’ Associated

Constructor Level I – Construction Fundamentals examination as part of CEM 455 Construction Management Practice. This course is taken in the student’s final semester. All students must take the exam and the results comprise a portion of their course grade.

The program uses this examination as a measure of academic quality. The goal established by the program is to exceed the national average pass rate on the exam. Historically, the performance of UNLV CM students has exceeded that goal; the data are shown in the table below.

**Historical UNLV Student Results on American Institute of Constructors’ Associated Constructor Level I Exam**

Year	UNLV Students			National (% Passing)
	Taking	Passing	% Passing	
2019	12	9	75	62
2018	5	0	0	59
2017	2	2	100	70
2016	5	4	80	52
2015	3	3	100	48
2014	9	6	67	49
2013	13	11	85	53
2012	8	6	75	58
2011	5	4	80	61
2010	19	17	89	62
2009	12	11	92	67

The American Institute of Constructors’ Associated Constructor Level I Exam provides significantly more information than just the pass rate. The table below shows the 2019 results from the 12 UNLV students who took the exam. UNLV students scored, on average, better than the national average in every subject area. Still, some areas were identified to be areas of weakness by AIC. These include: Understand the principles of sustainable construction (SLO 18); and Understand the principles of MEP (SLO 20). These areas (SLO 18 & SLO 20) are also considered areas of weakness nationally (based upon the national average score).

**2019 Subject Area scores for UNLV students compared to the national average.**

<b>Subject Area</b>	<b>UNLV Avg.</b>	<b>National Avg.</b>
SLO 1- Create written communications appropriate to the construction discipline.	80	75
SLO 2- Create oral presentations appropriate to the construction discipline.	75	71
SLO 3- Create a construction project safety plan.	75	73
SLO 4- Create construction project cost estimates.	75	72
SLO 5- Create construction project schedules.	79	74
SLO 6- Analyze professional decisions based on ethical principles.	77	73
SLO 7- Analyze construction documents for planning and management of construction processes.	76	73
SLO 8- Analyze methods, materials, and equipment used to construct projects.	74	70
SLO 9- Apply construction management skills as an effective member of a multi-disciplinary team.	76	74
SLO 10- Apply electronic-based technology to manage the construction process.	78	72
SLO 11- Apply basic surveying techniques for construction layout and control.	79	72
SLO 12- Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.	70	70
SLO 13- Understand construction risk management.	76	76
SLO 14- Understand construction accounting and cost control.	76	73
SLO 15- Understand construction quality assurance and control.	79	74
SLO 16- Understand construction project control processes.	83	79
SLO 17- Understand the legal implications of contract, common, and regulatory law to manage a construction project.	78	76
SLO 18- Understand the basic principles of sustainable construction.	67*	58
SLO 19- Understand the basic principles of structural behavior.	77	70
SLO 20- Understand the basic principles of mechanical, electrical and plumbing systems.	64*	59

\*considered to be an area of weakness by AIC

## **b. Alumni and Employer Surveys**

Associate Dean, College of Engineering deploys Alumni and Employer surveys every 3 years. Most recent survey was conducted in 2018. The surveys were designed so that each could be deployed as singular survey to simplify delivery. This Alumni survey collects information on all degree program in the college. Based on respondent' selection of degree, a different set of questions are posed.

While the 2018 survey results did not provide any startling results, there were some clear take away messages for the program. Overall, employers are satisfied with the program and our graduates. Alumni also are generally satisfied. Most Alumni chose "Agree" for most positively stated questions rather than "Strongly Agree." On the surface, this looks like all good news. However, we hoped for a much higher level of satisfaction from the biased audiences who took this survey. This tempered response likely results from a combination of factual observations, i.e. they truly have found areas in which we need to improve, and perception resulting from historical communication with the University. This lack of overwhelmingly positive results led to a complete review of the CM curriculum both by faculty and advisory board.

### **Table 2. Student Learning Outcomes - Results from the Questionnaire for Alumni and Employer Surveys (2018).**

*Likert scale ratings range from 5 (strongly agree) to 1 (strongly disagree). Shaded cells show average scores below the 3.5 target rating of "Agree."*

<b>Did your studies at UNLV help you develop the following capabilities?</b>	<i>Alumni</i>	<i>Employer</i>
SLO 1- Create written communications appropriate to the construction discipline.	4.1	4.43
SLO 2- Create oral presentations appropriate to the construction discipline.	4.4	4.57
SLO 3- Create a construction project safety plan.	4.3	4.43
SLO 4- Create construction project cost estimates.	4.6	4.67
SLO 5- Create construction project schedules.	4.6	4.33
SLO 6- Analyze professional decisions based on ethical principles.	4.1	4.67
SLO 7- Analyze construction documents for planning and management of construction processes.	4.3	4.33
SLO 8- Analyze methods, materials, and equipment used to construct projects.	4.4	4.50
SLO 9- Apply construction management skills as an effective member of a multi-disciplinary team.	4.1	4.50
SLO 10- Apply electronic-based technology to manage the construction process.	4.1	4.67
SLO 11- Apply basic surveying techniques for construction layout and control.	4.0	4.33
SLO 12- Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.	4.3	4.67
SLO 13- Understand construction risk management.	4.3	4.67
SLO 14- Understand construction accounting and cost control.	4.3	4.67
SLO 15- Understand construction quality assurance and control.	3.9	4.50
SLO 16- Understand construction project control processes.	4.3	4.67
SLO 17- Understand the legal implications of contract, common, and regulatory law to manage a construction project.	4.3	4.17
SLO 18- Understand the basic principles of sustainable construction.	4.0	4.67
SLO 19- Understand the basic principles of structural behavior.	4.1	4.67
SLO 20- Understand the basic principles of mechanical, electrical and plumbing systems.	3.9	4.50
<i>Likert scale ratings range from 5 (strongly agree) to 1 (strongly disagree)</i>		

### **c. Senior Exit Interviews and Surveys**

Senior exit surveys and interviews are also important components of program assessment. They provide essential student input on the program, its strengths, weaknesses, and areas of concern. First, students complete an online exit survey. Then the Department Chair interviews each graduate individually. Students are asked for their input related to all aspects of the program, including coursework, faculty, advising, career guidance, and any other related subject they may wish to raise. The Chair attempts to limit questions to clarification of specific points or as necessary to stimulate a productive conversation. These unstructured, open-ended discussions typically last 30 minutes each. Since data collected in this form is subject to bias, there is no attempt to gather quantifiable data. Instead, the Department Chair produces a summary of the interviews that is distributed to the faculty and Dean. The summary focuses primarily on synergistic issues raised by multiple graduates, although a critical issue raised by a single graduate could be sufficient to raise the concern to the faculty. Responses vary by issue, but the faculty attempt to respond to each issue appropriately.

The primary issue raised by the CM graduates during the Spring 2019 exit interviews was course scheduling; they want more courses at night. This is an important issue that merits careful consideration. While I understand their concerns, it is not clear whether night or day courses are best for the program's growth. Currently, we start out with day classes at the freshman level, then transition our CM courses to later in the day with the senior level courses all being in the evening.

The Exit Surveys provided more quantifiable information from the graduating students. The results are summarized in the Table below. In general, it shows widespread satisfaction with the CM program. It also shows that students believe that they successfully accomplished most of the Student learning objectives established for the program. There were several areas of concern identified (colored cells with score below 3.5) in 2017-2018 academic year. This issues were brought to the knowledge of respective instructors and several changes were made in the content and delivery. This has resulted in overall improvement in several SLO's in 2018-2019 academic year.

**Table 3. Student Learning Outcomes. Senior Exit Survey self-perception ratings student learning outcome attainment from 2017-2018 and 2018-2019 academic years** Shaded cells show average scores below the 3.5 target rating.

<b>Did your studies at UNLV help you develop the following capabilities?</b>	<b>2018</b>	<b>2019</b>
SLO 1- Create written communications appropriate to the construction discipline.	4.0	3.83
SLO 2- Create oral presentations appropriate to the construction discipline.	3.8	3.83
SLO 3- Create a construction project safety plan.	3.0	3.83
SLO 4- Create construction project cost estimates.	3.2	4.17
SLO 5- Create construction project schedules.	3.4	3.67
SLO 6- Analyze professional decisions based on ethical principles.	4.0	4.50
SLO 7- Analyze construction documents for planning and management of construction processes.	3.6	4.17
SLO 8- Analyze methods, materials, and equipment used to construct projects.	3.8	4.17
SLO 9- Apply construction management skills as an effective member of a multi-disciplinary team.	3.6	4.33
SLO 10- Apply electronic-based technology to manage the construction process.	3.6	3.50
SLO 11- Apply basic surveying techniques for construction layout and control.	3.6	3.67
SLO 12- Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.	4.0	4.67
SLO 13- Understand construction risk management.	3.6	4.33
SLO 14- Understand construction accounting and cost control.	2.8	4.00
SLO 15- Understand construction quality assurance and control.	3.2	4.00
SLO 16- Understand construction project control processes.	3.6	4.17
SLO 17- Understand the legal implications of contract, common, and regulatory law to manage a construction project.	4.0	4.67
SLO 18- Understand the basic principles of sustainable construction.	4.2	4.00
SLO 19- Understand the basic principles of structural behavior.	4.0	4.83
SLO 20- Understand the basic principles of mechanical, electrical and plumbing systems.	4.0	3.00
<i>Likert scale ratings range from 5 (strongly agree) to 1 (strongly disagree)</i>		

**d. Individual Course Assessments**

Internal reviews monitor performance of faculty and students on a routine basis to identify issues and concerns quickly and ensure program delivery and quality remains at a high level. Every course includes formal, anonymous evaluation by the students. The evaluation consists of three parts, course content, faculty performance, and student comments. These reviews are administered on-line and compiled by the UNLV to ensure anonymity. The results are provided individually to each faculty member and collectively to the Department Chair. The Department Chair uses the information to identify potential strengths, weaknesses, and concerns, then address those with individual instructors as appropriate. Actions are taken by the Department Chair, in consultation with the Dean, to remedy identified concerns as appropriate. Recently, course evaluation results have been summarized and distributed to all faculty in the following form:

Fall 2018 and Spring 2019 Teaching Evaluation Summary for Construction Management Courses

5.0	4.8	4.6	4.2	3.9	3.4
4.9	4.8	4.5	4.2	3.8	2.8
4.9	4.7	4.4	4.1	3.6	2.8
4.9	4.6	4.3	4.1	3.5	2.6
4.8	4.6	4.3	4.0	3.4	

These results are provided with this explanation of the color key:

- Green - Instructor did well; if you are at the low end of the spectrum, please continue your efforts to improve.
- Yellow - Instructor should commit themselves to improving your instruction and course management. However, if your course is unusually rigorous and that leads to a lower evaluation score, please continue to place quality over popularity.
- Red - Instructor needs to improve. Instructors in this category must prepare a written self-assessment of their performance in the course along with a goal for the next evaluation and specific strategies/changes to achieve that goal. This plan must be submitted to the Chair and a meeting held to discuss the plan. (none in this review)

Providing the data in this manner allows faculty to compare their performance with others in the department while respecting instructors' privacy. The results are used by individual instructor to improve course delivery and content.

**e. Student performance in Individual courses for SLO achievement**

Data is discussed in detail in Volume II. Results are summarized in following Table.



**Table 3.3. Results Obtained from Formal Assessment of Student Learning Outcomes & Recommendation to Improve Quality**

 **Achieved**
 **Partially achieved**
 **Not achieved**

Student Learning Outcomes	Assessment Results (Fiscal Year 2017/2018)			Assessment Results (Fiscal Year 2018/2019)		
	Direct	Indirect	Recommendations	Direct	Indirect	Recommendations
SLO # 1: Create written communications appropriate to the construction discipline.	Achieved	Achieved	No recommendations provided	Achieved	Achieved	No changes.
SLO # 2: Create oral presentation	Achieved	Achieved	The oral presentation was graded for the group. So it was recommended to be graded individually	Achieved	Achieved	This SLO assessment was recommended moving from CEM 453 course to CEM 450
SLO # 3: Create a construction project safety plan	Data not collected	Partially achieved	This SLO will be assessed in CEM 452 course from next year.	Achieved	Achieved	No changes.  In Fall 2019, this SLO was assessed in CEM 452 course and the performance criteria was met.
SLO # 4: Create construction project cost estimates	Not achieved	Partially achieved	The instructor of CEM 451 course recommended to increase the delivery of this topic by one day.	Achieved	Achieved	No changes.
SLO # 5: Create construction project schedules	Achieved	Partially achieved	No recommendations provided.	Achieved	Achieved	No changes.

Student Learning Outcomes	Assessment Results (Fiscal Year 2017/2018)			Assessment Results (Fiscal Year 2018/2019)		
	Direct	Indirect	Recommendations	Direct	Indirect	Recommendations
SLO # 6: Analyze professional decisions based on ethical principles.	Partially achieved	Achieved	AIC exam results was lower than national mean. The instructor of CEM 455 course was recommended to cover this topics in the class.	Achieved	Achieved	No changes.
SLO # 7: Analyze construction documents for planning and management of construction processes	Partially achieved	Achieved	AIC exam result was lower than national mean. The instructor of CEM 455 course was recommended to cover this topics in the class.	Achieved	Achieved	The instructor of CEM 253 course for spring 2019 was new and did not collect assessment data. It was recommended to collect data from next year
SLO # 8: Analyze methods, materials, and equipment used to construct projects.	Not achieved	Achieved	The course assessment and AIC exam results did not meet the performance criteria. So it was recommended to instructors of CEM 451 and CEM 455 courses to increase the delivery time of this topic in the classes.	Achieved	Achieved	No changes.
SLO # 9: Apply construction management skills as an effective member of a multi-disciplinary team.	Achieved	Achieved	No recommendations provided.	Achieved	Achieved	The new Capstone Course CEM 456 is being introduced from Fall 2020. It was recommended to measure this SLO in the class.

Student Learning Outcomes	Assessment Results (Fiscal Year 2017/2018)			Assessment Results (Fiscal Year 2018/2019)		
	Direct	Indirect	Recommendations	Direct	Indirect	Recommendations
SLO # 10 Apply electronic-based technology to manage the construction process	Achieved	Achieved	No recommendations provided	Achieved	Achieved	No changes.
SLO # 11: Apply basic surveying techniques for construction layout and control	Achieved	Achieved	No recommendations provided	Achieved	Achieved	No changes.
SLO # 12: Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.	Data not collected	Achieved	It was recommended to collect assessment data in another course.	Achieved	Achieved	No changes.  In Fall 2019, this SLO was assessed in CEM 100 course and the performance criteria was met.
SLO # 13: Understand construction risk management	Partially achieved	Achieved	AIC exam result was lower than national mean. It was recommended that the instructor of CEM 455 course should cover this topic in the class.	Achieved	Achieved	No changes.

Student Learning Outcomes	Assessment Results (Fiscal Year 2017/2018)			Assessment Results (Fiscal Year 2018/2019)		
	Direct	Indirect	Recommendations	Direct	Indirect	Recommendations
SLO # 14: Understand construction accounting and cost control	Partially achieved	Partially achieved	AIC exam result was lower than national mean. It was recommended that the instructor of CEM 455 course should cover this topic in the class.	Achieved	Achieved	No changes.
SLO # 15: Understand construction quality assurance and control	Partially achieved	Partially achieved	AIC exam result was lower than national mean. It was recommended that the instructor of CEM 455 course cover this topic in the class. It is recommended that this action will also increase the Senior Exit survey rating.	Achieved	Achieved	No changes.
SLO # 16: Understand construction project control processes	Partially achieved	Achieved	AIC exam result was lower than national mean. It was recommended that the instructor of CEM 455 course should cover this topic in the class.	Achieved	Achieved	No changes.
SLO # 17: Understand the legal implications of contract, common, and regulatory law to manage a construction project.	Data not collected	Achieved	The course assessment data was not collected. AIC exam result was lower than national mean. It was recommended that the instructor of CEM 455 course should cover this topic in the class.	Achieved	Achieved	No changes.  In Fall 2019, this SLO was assessed in CEM 100 course and the performance criteria was met.

Student Learning Outcomes	Assessment Results (Fiscal Year 2017/2018)			Assessment Results (Fiscal Year 2018/2019)		
	Direct	Indirect	Recommendations	Direct	Indirect	Recommendations
SLO # 18: Understand the basic principles of sustainable construction.	Achieved	Achieved	No changes.	Achieved	Achieved	Not required. This SLO should be assess in CEM 480 Sustainable Construction.
SLO # 19: Understand the basic principles of structural behavior	Partially achieved	Achieved	The course assessment did not meet the performance criteria. It was recommended that the instructor of CEM 270 course should spend additional time on lectures and problem solving sessions, and revise slides to better address students' needs. The instructor should also add an additional lecture to cover various problems involving internal forces	Achieved	Achieved	No changes.
SLO # 20: Understand the basic principles of mechanical, electrical and piping systems.	Partially achieved	Achieved	AIC exam result was lower than national mean. It was recommended that the instructor of CEM 455 course should review this topic in the class.	Achieved	Partially achieved	It was recommended that the instructor of CEM 350 and CEM 351 should cover the material that is construction related, current focus is on design related topics.

## **CM Course/Curriculum Review by Advisory Board**

Assessment results and the continual need to improve the program suggested that a comprehensive review of all existing CM courses in the program could potentially be useful. This review was conducted by the IAB Curriculum Committee in Spring of 2018 in the leadership of Mr. James Caviola.

This intensive review of the CM curriculum provided useful insights into what local employers are looking for in BSCM graduates. It also served to better inform the participants of the rigor within the current program. Many verbal comments were made about how “surprised” they were about the depth and breadth of the curriculum; they found it to be much more than they expected based upon their previous understanding. It also served to provide a foundation for our future discussion on program changes.

Committee suggested that drawing or specification reading skills and building codes should be emphasized in the curriculum to prepare students for their initial employment. After approval of faculty this was implemented.

Committee also suggested students be given elective options in the CEM courses to establish emphasis. Due to the small enrollment it was not considered feasible at that time. However, we will revisit this situation as enrollment grows.

The advisory board also reviewed Program Objectives in Spring 2019 and did not suggest any changes.

## **5. Actions Taken as a Result of Assessments**

Program assessments provide insightful information into the performance of the program and its success in meeting the objectives and learning outcomes. However, this information is only valuable if it is used to modify the program and improve the results. Several specific actions have resulted from our recent assessment efforts. Some selected actions are reported here. Each SLO folder provides details of all action taken related to individual courses.

- In last faculty retreat (August 2019), faculty decide to introduce Construction Management Capstone course in the CM curriculum (CEM 456). This course will be co-listed with Senior Design Course in Civil Engineering CEE 498. This will provide an opportunity for both Civil Engineering and Construction Management students to work in multi-disciplinary teams. CM students will also be able to participate in College of Engineering Senior Design competition. This change will not result in any increase in total credit requirements because a social science course has been dropped. This will start in Fall 2020.

- In fall of 2019 UNLV received Homebuilding Education Leadership Program (HELP) Award from National Housing Endowment. This funding will be used to develop programs of study in residential construction. A certificate program will start and students will have some course choice as electives.
- Content of CEE 121 Engineering Surveying have been modified to include a dedicated building layout exercise.
- Content of CEM 301 have been modified to include a dedicated safety plan development exercise.
- Based on student feedback, scheduling course CEM 453/L now includes use of both Microsoft Project and Primavera.
- Content of CEE 301 CAD tools for Civil Engineering Design has been modified to accommodate topics of interest (Site layout and Earthwork) for Construction Students.
- Students reported that one of our Part Time Instructors (PTI) was not delivering a course at a satisfactory level. Some investigation showed that this had been a recurring problem. After some discussion with the instructor, it was decided that it was best for all involved to find a new PTI for that course. Instructor was replaced in the next semester.

## 10. REVIEW LAST VISITING TEAM REPORT: WEAKNESSES AND CONCERNS

### Weaknesses

- 1. Documentation of Curriculum Core Subject Matter. [See Section 3.B.5 of this Report.] The Visiting Team could not verify the required topical content of 4.41 Basic Sketching and Drawing Techniques, 4.52 Site Organization and Development, or 5.67 Computer Applications in Project Management given the materials provided. [See ACCE Document 103, Section 3.4.3]**

This weakness resulted from our failure to provide complete documentation of Curriculum Core Subject Matter. The specific topics are addressed as follows:

4.41 Basic Sketching & Drawing - CEM 253: Students do an as-built drawing of an interior area (ceiling, walls, doors, etc.); CEM 451: Students submit a sketches with certain estimating problems as part of homework.

4.52 Site Organization & Development - CEM 452: Students required to layout job site for a mid-rise 10-story office building which includes site constraint issues; students required to perform productivity analysis on actual field projects including site issues. CEM 455: Students go through a sample project for a distribution/warehousing facility including site organization/development issues.

5.67 Computer Applications in Project Management- Students currently utilize estimating software in CEM 451 Estimating and scheduling software (Primavera P6) in CEM 453 Scheduling. Currently evaluating Prolog (Meridian Systems/Trimble) and Sage 300 Construction & Real Estate (Sage / Timberline) as to implementation in CEM 452 Cost Control and CEM 455 Construction Management Practice

- 2. Lack of Course Objectives in Relation to Program Goals. [See Sections 3.B.6 and 9.A. of this Report.] Course syllabi/outlines did not include course objectives in relation to the program goals and objectives. [See ACCE Document 103, Section 3.4.4]**

All CEM course syllabi now include course objectives in relation to the program goals and objectives.

- 3. Completeness of Notebooks Provided for Courses were Inconsistent. [See Section 3.B.6 of this Report.] Material provided in individual binders for review by the Visiting Team was inconsistent. [See ACCE Document 103, Section 3.2.1.2]**

The lack of completeness in course notebooks by certain instructors was unfortunate. Meetings to discuss notebook and documentation requirements and the importance of these to the accreditation visit took place with all faculty a full year in advance. We were surprised and disappointed that a few did not do their part and collect the required materials. Once it was realized that these documents were not collected, it was not



feasible to gather them. One instructor has been replaced partially due to this issue. A plan has been developed for improved “hands-on” follow-up with instructors for the next time.

**4. Inconsistency of Syllabi. [See Section 3.C. of this Report.] All syllabi must be presented in a standard, consistent format. [See ACCE Document 103, Section 3.2]**

We have discussed this issue with all part-time and full-time CEM faculty. They have revised course syllabi to reflect a common format.

## Concerns

1. Lab space for construction practice and principles. [See Section 6.A.1 of this Report.] While the Perini Construction Engineering Management Lab is an excellent facility, it does not appear to be currently set up to be a fully functional classroom as Graduate Assistants are utilizing it for office space. Additionally, there appears to be a limited amount of storage space for material, e.g. surveying equipment. [See ACCE Document 103, Section 6.1]

Perini Construction Engineering Management Lab has been repurposed into a graduate student office space and construction management research space. Additional storage space has been allocated to store surveying equipment.

2. Consistency in Administrative Procedures [See Section 3.A.1 of this Report]. Currently, there appears to be some inconsistency regarding following university requirements. Specifically, there appears to be some irregularity in the advising and monitoring of student academic progress. [See ACCE Document 103, Section 3.1.1].

Advising and monitoring of student academic progress has been streamlined. New director of advising, Christopher Parker has implemented several initiatives.

3. Academic Quality Plan. [See Sections 9.A. and 9.E. of this Report.] While an Academic Quality Plan (AQP) exists and data was collected, analyzed, and reported, the data and report is dated 2010. The plan does not appear to have been updated since 2010. Additional information was provided in the self-study but the program’s AQP has not been updated as stated in the stated “Action Plan.” [See ACCE Document 103, Section 9.3]

The Academic Quality Plan has been updated. It can be found at:  
[http://www.unlv.edu/sites/default/files/page\\_files/27/CEEEEC-ConstructionManagementProgramAssessmentInformation.pdf](http://www.unlv.edu/sites/default/files/page_files/27/CEEEEC-ConstructionManagementProgramAssessmentInformation.pdf)

4. Public Information. [See Section 8.B. of this Report.] While the required material is provided online for the public, the results are dated May of 2010. [See ACCE Document 103, Section 8.1]

Public Information about the program has been updated. It can be found at:  
[http://www.unlv.edu/sites/default/files/page\\_files/27/CEEEEC-ConstructionManagementProgramAssessmentInformation.pdf](http://www.unlv.edu/sites/default/files/page_files/27/CEEEEC-ConstructionManagementProgramAssessmentInformation.pdf)  
and <http://www.unlv.edu/ceec/academic-programs>.

5. Coverage of Ethics. [See Section 3.B.4 of this Report.] While Ethics is being covered in the required 5 Construction Management courses, students may not receive the required 15 instructional hours of ethics in the Construction and Construction Science courses regardless of the stand-alone ethics course. [See ACCE Document 103, Section 3.3.2]

Ethics is taught in construction-area coursework throughout the curriculum. We failed to document 15 instructional hrs due to confusion over the standard. We now require faculty to specifically identify construction ethics in course syllabi. A review of 2014-15 syllabi showed the following instructional hours in ethics:

CEM 100 - 2.0 hrs (ethics in construction)

CEM 253 - 3.5 hrs (bid shopping, bid peddling, drawing/spec interpretation, etc)

CEM 301 - 1.0 hrs (ethics and safety liability)

CEM 350 - 2.5 hrs (HVAC scams, energy conservation/sustainability/green building fraud, wasteful energy practices)

CEM 450 - 1.0 hrs (ethics in field inspection)

CEM 452 - 2.5 hrs (resumes and overstating qualifications, cost spreading, etc)

CEM 455 - 2.5 hrs (Constructor's 10 point Code of Ethics, ethical decision making)

CEM 480 - 2.0 hrs (ethics of sustainability and green building)

CEM 485 - 4.0 hrs (ethics in contracting, contract language, depositions, and expert testimony)

However, with changes in accreditation criteria (SLO's), this is not relevant anymore.

## **10.1 Previous Accreditation Actions**