



Proposal for a
Master of Science Program in Construction Management

Submitted by the

Department of Construction Management

Lyles College of Engineering

California State University Fresno

Yupeng Luo, Ph.D.

Associate Professor of Construction Management

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Proposal for a Master of Science Program in Construction Management

1.0. Program Type

- a. State-Support
- c. Delivery Format: Fully face to face (for majority of the courses)
- g. New Program

2.0. Program Identification

- a. Campus: Fresno State
- b. Full and exact degree designation and title: Master of Science in Construction Management
- c. Date the Board of Trustees approved adding this program projection to the campus Academic Master Plan: March 19-21, 2018
- d. Term and academic year of intended implementation: Spring 2020 or Fall 2020
- e. Total number of units required for graduation: 30 units
- f. Name of the department(s), division, or other unit of the campus that would offer the proposed degree major program: Department of Construction Management/Lyles College of Engineering
- g. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree program: Dr. Yupeng Luo, Associate Professor
- h. Statement from the appropriate campus administrative authority that the addition of this program supports the campus mission and will not impede the successful operation and growth of existing academic programs: See Attachment E
- i. The proposed program is NOT subject to WASC Substantive Change review.

3.0. Program Overview and Rationale

- a. Provide a brief descriptive overview of the program citing its 1) purpose and strengths, 2) fit with the institutional mission or institutional learning outcomes, and 3) the compelling reasons for offering the program at this time.

- 1) The purpose of the proposed MSCM program is to provide the technical competencies, financial knowledge, and entrepreneurial skills that are essential to today's leaders in the construction industry.

The proposed program is designed for recent college graduates as well as working professionals with architecture, engineering, construction (AEC), business or related backgrounds. It aims to prepare graduates to (a) fill upper management positions in the AEC industry; or (b) pursue Ph.D. studies in construction related fields, and eventually fill teaching and/or research positions in colleges and universities.

The proposed curriculum combines courses from both the Lyles College of Engineering and the Craig School of Business, covering most of the current theories and practices relevant to construction management.

- 2) This proposed program directly addresses the campus mission "To boldly educate and empower students for success". The existing bachelor's program has helped prepare local, regional, and national leaders in the construction industry for decades. Faculty and students in this new program will advance the established distinction to educate students for higher level opportunities in the industry, and produce transformative scholarly research and creative works that target regional issues with global significance.
- 3) The size, cost, and the sophistication of the modern construction industry require project managers possess a high level of construction knowledge and skills. The US Bureau of Labor Statistics anticipates a 14.6% employment growth in the construction industry from 2016 to 2026, while annual FMI studies regularly show that 80% of construction companies have trouble finding qualified mid-level managers and they expect to lose about 25% of their mid-level and senior managers to retirement within the next 10 years. Currently CSU East Bay is the only CSU campus that offers an MS degree program in Construction Management. Two other California schools, USC and New School of Architecture & Design, also have Master programs in Construction Management. However none of these are in the Central Valley. Fresno State will be the first of this kind in the region. A distinctive MSCM program attracts talents from/to the Central Valley and will certainly bring positive changes to our region.

b. Proposed catalog description

The M.S. in Construction Management program provides the technical competencies, financial knowledge, and entrepreneurial skills that are essential to today's leaders in the construction industry.

The program is designed for recent college graduates as well as working professionals with architecture, engineering, construction (AEC), business or related backgrounds.

It aims to prepare graduates to (a) fill upper management positions in the AEC industry; or (b) pursue Ph.D. studies in construction related fields, and eventually fill teaching and/or research positions in colleges and universities.

The program requires the completion of 30 semester units of coursework and a culminating experience following one of the three study plans below:

Plan A (Thesis)

- a. General core courses: CE210, MBA210, CM220, CM230, CM240 (15 units)
- b. CM Electives: two from CM144, CM150, CM151, CM177, CM291T (6 units)
- c. Elective outside CM: one from CE206, FIN120, FIN123, FIN131, FIN186, MBA212, MBA213, MBA232 (3 units)
- d. CM299 Thesis (6 units)

Total 30 units

Plan B (Project)

- a. General core courses: CE210, MBA210, CM220, CM230, CM240 (15 units)
- b. CM Electives: two from CM144, CM150, CM151, CM177, CM291T (6 units)
- c. Elective outside CM: one from CE206, FIN120, FIN123, FIN131, FIN186, MBA212, MBA213, MBA232 (3 units)
- d. One from CM290 and CM293 (3 units)
- e. CM298 Project (3 units)

Total 30 units

Plan C (Comprehensive Exam)

- a. General core courses: CE210, MBA210, CM220, CM230, CM240 (15 units)
- b. CM Electives: two from CM144, CM150, CM151, CM177, CM291T (6 units)
- c. Elective outside CM: one from CE206, FIN120, FIN123, FIN131, FIN186, MBA212, MBA213, MBA232 (3 units)
- d. CM290 and/or CM293 (6 units)
- e. Comprehensive Exam (0 units)

Total 30 units

Advising Notes:

1. Courses that are not listed here but are well suited to the student's graduate program may be taken as electives upon approval by the supervising faculty and Graduate Program Coordinator.
2. For electives, a minimum grade of B is required. Similar courses previously taken and counted towards another degree are excluded.

Below is a summary of all required courses for graduation including electives. Students without a bachelor's degree, a minor, or a certificate in construction management are required to complete the foundation CM courses (i.e. CM7S, CM18, CM20, CM110, CM116, CM170) before taking the following courses.

Course Number & Title	Units	Prerequisites/ Co-requisites	Notes
CE210 Research Methods	3.0	No prerequisites	Core
MBA210 Leadership and Organizational Behavior	3.0	No prerequisites	Core
CM220 Advanced Planning and Preconstruction	3.0	No prerequisites	Core
CM230 Advanced Construction Operations Management	3.0	No prerequisites	Core
CM240 Advanced Construction Business Strategy	3.0	No prerequisites	Core
CM144 Construction Site Planning and Development	3.0	No prerequisites	Elective
CM150 Building Construction	3.0	No prerequisites	Elective
CM151 Heavy Civil Construction	3.0	No prerequisites	Elective
CM177 Sustainable Construction	3.0	No prerequisites	Elective
CM291T Special Topics	3.0	No prerequisites	Elective
CE206 Engineering	3.0	No prerequisites	Elective

Environmental Impact			
FIN120 Principles of Finance	3.0	ACCT4A highly recommended	Elective
FIN123 Business Forecasting	3.0	DS 123 or an equivalent course determined by the Department of Finance and Business Law	Elective
FIN131 Entrepreneurial Finance	3.0	MBA212 or FIN120	Elective
FIN186 Business and Real Estate Economics	3.0	No prerequisites	Elective
MBA212 Financial Management	3.0	ACCT4A or MBA201	Elective
MBA213 Managerial Accounting	3.0	ACCT4A or MBA201	Elective
MBA232 Seminar in Investments and Portfolio Management	3.0	MBA212 or FIN120	Elective
CM290 Independent Study	3.0/6.0	Permission of the graduate program coordinator	
CM293 Internship	3.0	Permission of the graduate program coordinator	
CM298 Project	3.0	Permission of the graduate program coordinator	Culminating Experience
CM299 Thesis	3.0	Permission of the graduate program coordinator	Culminating Experience
Comprehensive Exam	0.0	Permission of the graduate program coordinator	Culminating Experience

4.0. Curriculum

- a. Institutional learning outcomes (ILOs) and Program learning outcomes (PLOs)

Institutional Learning Outcomes (ILOs) at Fresno State:

1. Developing a foundational, broad and integrative knowledge
2. Acquiring specialized knowledge
3. Improving intellectual skills
4. Applying knowledge
5. Exemplifying equity, ethics, and engagement

Program Learning Outcomes (PLOs):

1. Problem solving and decision making
2. Effective and professional oral and written communication
3. Use of information and communication technology
4. Principles of leadership in business and management
5. Professional ethics including application to situations and choices
6. Advanced construction management practices
7. Research methods

- b. Assessment plan and curriculum map matrix
See Attachment A

- c. Total number of units required for graduation: 30 units

- f. New graduate-level courses proposed (See Attachments G, H, I, and J for New Graduate Course Requests):

- CM220 Advanced Planning and Preconstruction
- CM230 Advanced Construction Operations
- CM240 Advanced Construction Business Strategy

- g. Proposed course-offering plan for the first three years of program implementation (“X”: to be offered)

	2020		2021		2022	
	Spring	Fall	Spring	Fall	Spring	Fall
CE210	X	X	X	X	X	X
CM220	X		X		X	
CM230		X		X		X
CM240		X		X		X
MBA210	X	X	X	X	X	X

- h. The minimum requirements for the culminating experience.
Students are expected to complete 6 semester units for their culminating experience following one of the following study plans:

- Plan A (Thesis):

CM299 Thesis (6.0)

- Plan B (Project):
CM298 Project (3.0) and CM290 Independent Study (3.0); or
CM298 Project (3.0) and CM293 Internship (3.0)
- Plan C (Comprehensive Exam):
CM293 Internship (6.0) and Comprehensive Exam (0.0)
CM290 Independent Study (3.0), CM293 Internship, and Comprehensive
Exam (0.0)

A student can take the comprehensive exam no more than three times.

- i. Corresponding bachelor's program and accreditation requirements
Students are expected to possess a bachelor's degree in construction management from an accredited program; or a bachelor's degree in a related field from an accredited program with a minor or a certificate in construction management.
- j. Admission criteria, including any prerequisite coursework
Admission: The requirements for graduate admission to California State University, Fresno must be met. Graduate Record Examination (GRE) scores must be received by the application deadline for International Student applicants and within 30 days after the application deadline for Domestic Student applicants. A score of 300 or better is highly recommended. Applicants must have completed College Algebra, Trigonometry, and general statistics; or equivalent level math courses. Also, applicants should possess a bachelor's degree in construction management from an accredited program; or a bachelor's degree in a related field from an accredited program with a minor or a certificate in construction management. Applicants must have a minimum overall GPA of 2.8 in their undergraduate education AND a minimum GPA of 3.0 in the construction management related courses attempted, on the basis of 4.0 being A; or the approval of the Graduate Committee of the Department of Construction Management. In addition, applicants also need to submit the following: (a) a personal statement explaining their motivation for pursuing the MSCM degree; (b) a resume detailing their professional and academic achievements; and (c) two letters of recommendation.

International applicants should also refer to the International Student Services and Programs (ISSP) for further graduate admission requirements:

<http://fresnostate.edu/academics/issp/future/graduate.html>

If an applicant's preparation is deemed insufficient by the Graduate Committee of the Department of Construction Management, the applicant is required to take additional courses which are specified in writing to remove the deficiency. Such courses, taken as an unclassified student, are in addition to the minimum of 30 semester hours credit for the MSCM degree. The department graduate program coordinator shall appoint an interim graduate adviser for each student when that student is accepted into the graduate program. The coordinator will take into account student interests and correlated faculty interests when making this appointment.

Foundation Courses: Students without a bachelor's degree, a minor, or a certificate in construction management are required to complete the following foundation CM courses prior to entering the MSCM program:
CM7S, CM18, CM20, CM110, CM116, CM170

Please also note that ACCT4A is highly recommended as it is the prerequisite for several business electives included in the MSCM curriculum.

In some cases the course requirements may be modified or waived by the Graduate Program Coordinator or the senior faculty responsible for the course area of study.

i. Criteria for student continuation

Students should select a graduate adviser before completing 9 units of graduate study and advancing to candidacy. Other members of his or her graduate committee shall be selected in consultation with the graduate adviser if the student has selected Plan A. This committee shall consist of a total of three members, two of whom must be tenured/tenure track faculty.

A graduate student may change graduate advisers. He or she needs to fill out a form and has it signed by the advisers and the department Graduate Coordinator.

A student must pass CE 210 with a grade of B or higher and satisfactorily complete a written examination (typically administered in CE 210) before being eligible for Advancement to Candidacy; this satisfies both the university's graduate writing requirement and demonstrates the student has sufficient technical proficiency to continue in the program.

Any semester for which the grade point average falls below 3.0 shall result in placing the affected graduate student on probation. A second offense shall lead to disqualification. For additional information, please refer to the Division of Research and Graduate Studies, Administrative Academic Probation, Academic Disqualification.

A student can take the comprehensive exam no more than three times.

m. An advising "roadmap"

See **3.0 b.**

n. The proposed program is **NOT** pursuing accreditation.

5.0. Societal and Public Need for the Proposed Degree Major Program

- a. Fresno State is one of the seven CSU campuses (i.e. CSU East Bay, Cal Poly SLO, CSU Long Beach, CSU Chico, CSU Sacramento, CSU Northridge, CSU Fresno) that offer a B.S. in Construction Management. The program has been in existence for over 30 years. Currently CSU East Bay is the only CSU campus that offers an MS degree program in Construction Management. Two other California schools, USC and New School of Architecture & Design, also have Master programs in Construction Management. However, none of these are in the Central Valley. Fresno State will be the first of this kind in the region. The Department of Construction Management at Fresno State has a long history of preparing construction professionals to serve the needs throughout the west coast. The proposed Master's degree program provides advanced knowledge and skills essential for leadership positions in the industry. Students and professionals in the Valley deserve to have the opportunity to continue pursuing career successes.

- d. Construction is one of the largest industries in the U.S. The size and the sophistication of the industry, as well as the cost of modern construction operations require project managers possess a high level of construction knowledge and skills. The US Bureau of Labor Statistics anticipates a 14.6% employment growth in the construction industry from 2016 to 2026, which is much faster than average. Annual FMI studies regularly show that 80% of construction companies have trouble finding qualified mid-level managers and they expect to lose about 25% of their mid-level and senior managers to retirement within the next 10 years. The fact that California has more than 290,000 licensed contractors while its universities graduate fewer than 500 with Construction Management Bachelor's degrees and even fewer with Master's degrees per year predicts an unlimited demand for well-educated construction managers in the foreseeable future.

6.0. Student Demand

- a. Interests in establishing an MSCM program were gauged locally and regionally through two surveys, one among our engineering student body (see Attachment B) and the other among employers of construction professionals in the Central Valley (see Attachment C). The results of the two surveys are summarized below.

The student survey was sent to the engineering students especially targeting those majoring in Construction Management or Civil Engineering and graduating within the next two years (Note that many CE students are pursuing a CM minor at Fresno State). 60 survey entries were logged. A majority of the respondents believe that the need for a Master Program in Construction Management at Fresno State is either strong or moderate. It is encouraging to see that most student respondents are interested in pursuing graduate studies immediately after graduation. They also seemed to appreciate the proposed curriculum. More detailed discussion of the survey results can be found in Attachment B.

The employer survey was sent to the CM department industry advisory board. 44 survey entries were logged, which represents a good sample size for the study. A majority of the respondents believe that the need for a Master Program in Construction Management at Fresno State is either strong or moderate. A vast majority of these employers are supportive of their employees enrolling in the proposed program. The data also indicates graduates of the proposed program are likely to find jobs here in the Central Valley. More detailed discussion of the survey results can be found in Attachment C.

b. Diversity

To ensure a diverse and qualified candidate pool, the department will use multiple forms of publicity to promote the MSCM program, such as the department web page, the department newsletter, alumni networking events, professional group meetings/ mailing lists, academic conferences, etc. In the meantime, the department will also host information sessions within the Lyles College of Engineering to encourage current undergraduate students that show promise and interest for the MSCM program to apply. The current CM undergraduate capstone series require each student complete an individual research project under the supervision of a faculty subject matter expert (SME), which provides great opportunities to mentor outstanding prospective students. It is worth noting that the college has a very diverse student body. The latest stats show the top three groups by race/ethnicity in the fall 2018 undergraduate cohort are Hispanic (51.2%), White (19.2%), and Asian (13.2%). 54.5% are underrepresented minority. 65.8% are first generation college students.

The department will carefully plan the courses to suit the needs of both full-time graduate students and working professionals. Some courses will be held on weekday evenings.

c. For master's degree proposals, cite the number of declared undergraduate majors and the degree production over the preceding three years for the corresponding baccalaureate program, if there is one.

Major headcount by semester:

- Fall 2015: 121
- Spring 2016: 110
- Fall 2016: 128
- Spring 2017: 134
- Fall 2017: 160
- Spring 2018: 148

BSCM degrees awarded by academic year:

- 2015 - 2016: 26
- 2016 - 2017: 20
- 2017 - 2018: 16

- d. The proposed MSCM is a professional degree program that prepares graduates to:
 - fill upper management positions in the AEC industry; or
 - to pursue Ph.D. studies in construction related fields, and eventually fill teaching/research positions in colleges and universities.
- e. Expected number of students enrolled in the MSCM program in Year 1: 10-15
Expected number of students enrolled in the MSCM program in Year 3: 10-15
Expected number of students enrolled in the MSCM program in Year 5: 15-20

7.0. Existing Support Resources for the Proposed Degree Major Program

- a. The core graduate faculty team for the proposed program consists of five faculty members from three departments: Construction Management, Civil & Geomatics Engineering, as well as Finance and Business Law.
- **Dr. Jacquelin Curry**
Dr. Curry is an Assistant Professor in the Department of Finance and Business Law of the Craig School of Business at California State University, Fresno. She received her Juris Doctor from San Joaquin College of Law. Dr. Curry's intellectual contributions and professional activities are focused in the areas of finance, real estate valuation, real estate law and ethics, and effectiveness of business communication instruction. Dr. Curry has over 14 years of professional experience in the real estate industry. She is the faculty director of the Gazarian Real Estate Cohort program. She is also an academic advisor for certain projects within the MBA program at the Craig School of business.
 - **Professor Brad Hyatt**
Professor Brad Hyatt is an Associate Professor and the Chair of the Department of Construction Management in the Lyles College of Engineering at California State University, Fresno. He has a Master of Science in Engineering with a focus on Construction Engineering and Project Management from The University of Texas at Austin and a Bachelor of Science in Civil Engineering from the University of Kentucky. He actively conducts research on data and predictive analytics in construction, leadership in construction, lean construction practices, and integrating technology into construction education. Professor Hyatt is also Registered Professional Engineer in California and LEED Accredited Professional with over twenty years of professional experience in program and project management of facilities, engineering, and construction projects. His broad expertise includes sustainable design and construction, facilities management, construction management, capital improvements planning, energy management, disaster response, and construction work force shaping. He has managed a variety of projects from a large, complex replacement hospital to small fuel tank renovations.

- **Dr. Yupeng Luo**

Dr. Yupeng Luo is an Associate Professor in the Department of Construction Management of the Lyles College of Engineering at California State University, Fresno. She holds an M.S. in Civil Engineering with a focus on Structural Engineering from the University of Pittsburgh and a Ph.D. in Architectural Engineering with a focus on Construction Management from the Pennsylvania State University. Her research and practice interests include sustainable building solutions, building performance measurement, decision-making & optimization, service-learning and community engagement. Dr. Luo is a LEED AP BD+C and a CM-BIM holder.

- **Dr. Arezoo Sadrinezhad**

Dr. Arezoo Sadrinezhad is an assistant professor of Civil Engineering in the Lyles College of Engineering at California State University, Fresno. She earned her PhD in Civil Engineering with emphasis in Geotechnical Engineering. She also has a PE license in the State of California. Prior to pursuing a PhD, Dr. Sadrinezhad was working as a seismic specialist and design engineer. She contributed to the seismic rehabilitation of more than fifty schools and hospitals. She also contributed in design of multiple superstructures and substructures. Her research and practice experiences include probabilistic constitutive modeling of soils, seismic design of structures/geostructures, and performance-based design.

- **Dr. Wei Wu**

Dr. Wei Wu is an Associate Professor in the Department of Construction Management in Lyles College of Engineering at California State University, Fresno. He received his Bachelor of Engineering in Built Environment and Equipment Engineering from Hunan University in China, Master of Science in Environmental Change and Management from University of Oxford in the UK, and Doctor of Philosophy in Design, Construction and Planning from University of Florida. Dr. Wu's research interests include building information modeling, construction graphics and visualization, green building and sustainable construction, workforce development, cyberlearning and educational technology, construction and engineering education. Dr. Wu has published more than 40 articles and conference proceedings in these areas. Dr. Wu's research has been funded by regional and federal agencies including a recent National Science Foundation (NSF) grant on investigating Mixed Reality (MR) for career-specific competency cultivation among construction management and engineering students.

As detailed in the department memos (see Attachment D), the CM, MBA, and FIN courses would be taught by current faculty in those departments respectively. Several of the courses listed in the proposed curriculum are existing courses with enrollment capacity.

- b. The facilities that would be used in support of the proposed program are mainly lecture rooms, computer laboratories, and the CM outdoor laboratory. We anticipate

a gradual but steady increase in graduate student enrollment over time as a result of the establishment of the MSCM program. We expect that the growth in enrollment can be accommodated without the need for any new additional lecture rooms and/or laboratories.

- c. Access to both electronic and physical library and learning resources
The Henry Madden Library at Fresno State provides over 150 computer workstations for access to the Library catalog, the Internet, and a range of Microsoft Office applications. Many of the library's resources and services are available 24 hours a day, 7 days a week, including 24/7 live chat, over 800,000 e-books and other e-publications, electronic access to over 50,000 journals, magazines, and newspapers, over 270 databases, streaming video and audio titles, research and course guides, etc.
- d. Available academic technology, equipment, and other specialized materials
The Department of Construction Management recently opened its Digital Building & Integration Lab (DBI-Lab) which pursues synergistic integration of digital design/visualization technology and lean construction process to intervene capital project delivery. The DBI-Lab hosts cutting-edge Virtual Reality (VR) and Mixed Reality (MR) devices including the HTC VIVE and Microsoft HoloLens, as well as a MakerBot 3D printer. The DBI-Lab provides an ideal technology-driven collaboration space for students, faculty and community partners.

8.0. Additional Support Resources Required

The proposed MSCM program is structured to minimize the impact on current the current course offerings by Department of Construction Management while leveraging courses within existing graduate programs at Fresno State. The MSCM program is structured to offer approximately three graduate level CM courses on an annual basis. This can be done within the existing cost structure of the BSCM program, which requires eight (8) elective courses to be offered on an annual basis. Therefore, the MSCM program would replace 3 of these electives, which would reduce the BSCM electives to 5 per academic year. This reduction is not anticipated to have an impact on the current time to graduation for BSCM students.

We do not anticipate needing additional instructional resources during the next three years.

Attachment A: Student Learning Outcomes (SLOs) Assessment Plan

I. Mission, Vision, Values & Program Objectives

The mission of the Department of Construction Management is to “*develop professionals, build leaders, and sustain learners for the architecture, engineering and construction (AEC) industry*”. The vision of the Department of Construction Management is to “*build prominent engaged leaders in the regional, national, and international construction industries*”.

The Department of Construction Management is also committed to the following values:

- Excellence in teaching, mentoring, and leadership
- Collegiality and strong sense of academic community
- Strong ties with alumni and industry
- Diverse, family environment
- Enriched, universal learning
- Work-life balance
- Professionalism and mutual respect
- Community engagement
- Experiential learning

The Department of Construction Management has the following educational program objectives:

- Establish the technical and management abilities of a construction professional (project management)
- Manifest the qualities of a construction leader (business/team leadership)
- Define lifelong learning and list specific ways that you can continuously improve your knowledge, skills, and abilities throughout your construction career

II. Program Learning Outcomes and Student Learning Outcomes

The following are the seven Program Learning Outcomes (PLOs) for the MSCM program.

1. Problem solving and decision making
2. Effective and professional oral and written communication
3. Use of information and communication technology
4. Principles of leadership in business and management
5. Professional ethics including application to situations and choices
6. Advanced construction management practices
7. Research methods

III. PLOs and Course Mapping

A comprehensive mapping was conducted to allocate the PLOs assessment effort to relevant courses. The complete mapping is summarized below in Table 1. The PLOs will be assessed at

different levels in these courses, which include: I = Introduced, R = Reinforced, E = Emphasized, and M = Mastered. Courses that are used to directly assess the allocated PLOs will be labeled with Direct Assessment (DA). Assessment of outcomes will be carried out systematically every two years.

Table 1 MSCM PLOs and Course Mapping

Courses	PLO's DA	PLOs						
		1	2	3	4	5	6	7
CE210	2, 7		I, DA					I, DA
CM220	1, 3	M, DA	R	I, DA				
CM230	4, 6			R	I, DA		E, DA	
CM240	1, 5, 6	M, DA				E, DA	M, DA	
CM298/ CM299/ Comp. Ex	2, 3, 7		M, DA	M, DA	M	M	M	M, DA
MBA210	4, 5				E, DA	I, DA		

By allocating the PLOs to specific courses, it is possible to establish the mapping between these PLOs with specific course Student Learning Outcomes (SLOs). This strategy will help reduce instructors' assessment workload, and ensure consistency between course level and program level assessment efforts.

IV. Assessment Methods

Assessment of the PLOs is achieved through formative instruments to measure students' progress while going through the program, and with summative instruments to measure the students' level of achievement at the end of the program. Assessment methods are also divided into direct measures and indirect measures. Direct measures are defined here as first-hand objective assessments of student learning. Direct measure instruments are typically implemented by a course instructor. Indirect measures are defined here as subjective assessments of student learning that are typically reported by the student or a third-party. In summary, the CM department will use the following direct and indirect measures for PLOs assessment:

- **Direct Measures**
 - Course specific assignments, quizzes, projects (formative)
 - Culminating experience: Project, Thesis, Comprehensive Exam (summative)
- **Indirect Measures**
 - Course specific surveys and peer evaluations (formative)
 - MSCM Student Internship Report (formative)
 - MSCM Graduate Exit Survey (Fall & Spring, summative)
 - MSCM Alumni Survey (Spring, summative) - to be administered 2 years after the launch of the program
 - Employer Survey (Fall, summative) - to be administered 2 years after the launch of the program

Table 2. Course Assessment Matrix

SLOs #	PLOs #	Assessment Measures (2 minimum)		Minimum Standards	Assessment Targets
		Direct Measures (DM, 1 minimum.)	Indirect Measures (IM)		

Table 2 shows a sample course assessment matrix. The primary mechanism for assessing the PLOs is to assess the courses labeled as Direct Assessment with the mapped SLOs with a two-year review cycle.

Attachment B: Student Survey Results

The student survey was sent to the engineering students specifically targeting those majoring in Construction Management or Civil Engineering and graduating within the next two years. 60 survey entries were logged. Results that are most pertinent to the proposal for establishing an MSCM program at Fresno State are discussed below. The full set of results is available upon request.

***Question:** In your opinion, is there a need for a Master Program in Construction Management at Fresno State?*

Student responses reveal that 50% of the respondents believe that there is a “strong need” for the proposed MSCM program and 31% of the respondents believe that there is a “moderate need”. Therefore, a majority (81%) of the respondents believe that the need is either strong or moderate with strong need being the dominant response.

***Question:** Are you interested in graduate studies yourself?*

The results indicate a strong interest in graduate studies with 81% of the respondents selecting “Yes” and the rest answering “Not Sure”.

***Question:** If you are interested in graduate studies, when would you like to start?*

100% of the respondents answered “Immediately after graduation”.

***Question:** What would be your preferred method of instruction for a graduate degree?*

The majority (75%) selected “Combination of Online and Face-to-Face”. The rest (25%) of the respondents selected “Residency (i.e. face-to-face classes).”

***Question:** Would you require university financial assistance to pursue this degree?*

A majority (81%) of the respondents answered “Yes” and expected some financial assistance from the university.

***Question:** What areas of studies would you be most interested in? Select all that apply.*

The top five choices are: Construction Project Management (18.46%), Construction Engineering (15.38%), Construction Field Operations Management (13.85%), Design/Build Management (13.85%), and Sustainable Design and Construction (10.77%)

***Question:** What aspects of the proposed program are of greatest importance to you?”*

“Knowledge Gain” was selected by 69% of the respondents as being most important, followed by “Skills Gain/Training” (63%) and then “Degree Attainment” (56%).

Question: What is your overall assessment of this proposed program? Does it make sense? What are its strengths/limitations?

This is an open-ended question. Feedbacks are mostly positive. Students seem to like the proposed program.

Instructions

Student Survey on the Establishment of a Master Program in Construction Management at Fresno State

Instructions

- Please take a few minutes to help us learn about your opinion on the proposed design of a new master program in Construction Management at Fresno State.
- A description of the proposed master program curriculum can be found at the following site: <http://www.fresnostate.edu/engineering/cm/programs/mscm.html>
- If you do not believe you have sufficient information to answer a particular question or you do not wish to comment, you do not need to supply an answer.
- If you have additional comments or input that do not fit in the survey, please send them to Dr. Vivien Luo at viluo@csufresno.edu.

Thank you for your time. The confidentiality of your response to this survey will be strictly maintained.

General Information

Expected Graduation Date:

2017

2018

2019

What degree(s) are you currently pursuing?

- BS in Construction Management
- BS in Civil Engineering
- BS in another engineering major (Please specify)
- Minor in Construction Management
- Minor in Business
- Other (Please specify)

Interests in Graduate Education

In your opinion, is there a need for a Master Program in Construction Management at Fresno State?

- Strong Need
- Moderate Need
- No Need
- Not Sure or No Opinion

Are you interested in graduate studies yourself?

- Yes
- No
- Not sure

If you are interested in graduate studies, when would you like to start?

- Immediately after graduation
- Within 2 years after graduation
- Within 5 years after graduation
- Unsure

What would be your preferred method of instruction for a graduate degree?

- Residency (i.e. face-to-face classes)
- Online
- Combination of Online and Face-to-face

Would you require university financial assistance to pursue this degree?

- Yes
- No

What areas of studies would you be most interested in? Select all that apply.

- Construction Project Management
- Construction Quality Management
- Construction Field Operations Management
- Sustainable Design and Construction
- Construction Technology
- Design/Build Management
- Construction Engineering
- Lean Construction Practices
- Facilities Management
- Other (Please specify)

Please read the proposed CM Master Program via this link:

<http://www.fresnostate.edu/engineering/cm/programs/mscm.html>

What aspects of the proposed program are of greatest importance to you?

	Not Important	Important	Very Important
Degree Attainment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge Gain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Skills Gain/Training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What is your overall assessment of this proposed program? Does it make sense? What are its strengths/limitations?

Powered by Qualtrics

Attachment C: Employer Survey Results

The survey was sent to the CM department industry advisory board. 44 survey entries were logged, which represents a good sample size for the study. Results that are most pertinent to the proposal for establishing an MSCM program at Fresno State are discussed below. The full set of results is available upon request.

Question: *In your opinion, is there a need for a Master Program in Construction Management at Fresno State?*

Employer responses reveal that 31% of the respondents believe that there is a “strong need” for the proposed MSCM program and 50% of the respondents believe that there is a “moderate need”. Therefore, a majority (81%) of the respondents believe that the need is either strong or moderate.

Question: *What aspects of the proposed program are of greatest importance to you?”*

“Skills Gain/Training” was selected by 77% of the respondents as being most important, followed by “Knowledge Gain” (58%) and then “Degree Attainment” (20%). Some highlights in recommended changes to the proposed program include:

- Integrating critical contents into the proposed courses, such as risk management, safety, construction and employee finances, negotiating skills, conflict avoidance, contract law, BIM, etc.
- Adding electives on Conflict Engagement, ADR principles, Claim Management.
- Allow work experience to count toward internship.

Question: *“What academic skills should CM master graduates have as they enter the job market that they would typically not possess after earning their BSCM or equivalent degree? Check up to three.”*

The top three selections are “Project Control (advanced)” (85%), “Oral and Written Communication” (65%), and “Technical Analysis (advanced)” (46%). Also important are “Data Management and Analytics” and “Design Capabilities (advanced)”.

Yes/No Questions:

Current employees who perform AEC-related work but do not have an AEC-related graduate degree would benefit from having a CM Master's degree.

84% of the respondents answered YES.

Would support employees enrolling in the proposed CM Master Program.

92% of the respondents answered YES.

Would support employees enrolling in a shorter graduate certificate program.

92% of the respondents answered YES.

Would support employees enrolling if courses were offered largely on-line.

50% of the respondents answered YES.

Responses to the Yes/No questions above indicate a vast majority of these employers are supportive of their employees enrolling in the proposed program. Also there appears to be great interests in on-line classes, on-line or hybrid classes may be considered as an option at a later stage.

Question: *Indicate the number of (a) individuals in your firm/agency with a BSCM or equivalent could benefit from the proposed Master program and (b) positions in your firm/agency that could be filled by the proposed master program graduates.*

The data reflects a wide range of sizes in company and agency. 96% of the respondents believe they have more than 1 individual with a BSCM or equivalent who could benefit from the proposed program, while 88% of the respondents believe they have more than 1 position that could be filled by CM master graduates. Overall the data indicates that graduates of the proposed program are likely to find jobs here in the Central Valley, which is consistent with the previous results that showed there was a great need for such a program.

Question: *What is your overall assessment of this proposed program? Does it make sense? What are its strengths/limitations?*

This is an open-ended question. Employer comments are largely supportive of the creation of a MSCM program. The results will be evaluated over time and be used to improve the program structure, contents, and mode of delivery.

Instructions

Employer Survey on the Establishment of a Master Program in Construction Management at Fresno State

Instructions

- Please take a few minutes to help us learn about your opinion on the proposed design of a new master program in Construction Management at Fresno State.
- A description of the proposed master program curriculum can be found at the following site: <http://www.fresnostate.edu/engineering/cm/programs/mscm.html>
- If you do not believe you have sufficient information to answer a particular question or you do not wish to comment, you do not need to supply an answer.
- If you know of other architecture, engineering, and construction (AEC) professionals that we should contact to participate in our study, or if you have additional comments or input that do not fit in the survey, please send them to Dr. Vivien Luo at viluo@csufresno.edu.

Thank you for your time. The confidentiality of your response to this survey will be strictly maintained.

General Information

Company Name:

Position Title:

What best describes your company?

- Owner
- Builder
- Prime Contractor
- Specialty Contractor
- Consultant
- Construction Manager
- Designer/Engineer
- Developer
- Other (Please specify)

What is the **primary sector** in which your firm works?

- Commercial Building
- Industrial/Manufacturing
- Institutional/Government Building
- Utilities/Oil/Gas
- Residential Building
- Heavy Civil/Infrastructure
- Other (Please specify)

Interests in Graduate Education

Please identify areas of professional knowledge or skills that will be most important for your organization in the next decade. Choose up to three.

- Construction Project Management
- Construction Quality Management
- Construction Field Operations Management
- Sustainable Design and Construction
- Construction Technology
- Design/Build Management
- Construction Engineering
- Lean Construction Practices
- Facilities Management
- Other (Please specify)

In your opinion, is there a need for a Master Program in Construction Management at Fresno State?

- Strong Need
- Moderate Need
- No Need
- Not Sure or No Opinion

Please read the proposed CM Master Program via this link:

<http://www.fresnostate.edu/engineering/cm/programs/mscm.html>

What aspects of the proposed program are of greatest importance to you?

	Not Important	Important	Very Important
Degree Attainment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge Gain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Skills Gain/Training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not Important	Important	Very Important
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What changes would you recommend be made in the proposed CM Master Program?

What academic skills should CM master graduates have as they enter the job market that they would typically not possess after earning their BSCM or equivalent degree? Check up to three.

- Project Control (Advanced)
- Technical Analysis (Advanced)
- Design Capabilities (Advanced)
- Computer Modeling (Advanced)
- Literature Research
- Data Management and Analytics
- Oral and Written Communication
- Other (Please specify)

As an employer, please answer the following questions to the best of your knowledge.

	Yes	No
Current employees who perform AEC-related work but do not have an AEC-related graduate degree would benefit from having a CM Master's degree	<input type="radio"/>	<input type="radio"/>
Would support employees enrolling in the proposed CM Master Program	<input type="radio"/>	<input type="radio"/>
Would support employees enrolling in a shorter graduate certificate program	<input type="radio"/>	<input type="radio"/>
Would support employees enrolling only if courses were offered largely on-line	<input type="radio"/>	<input type="radio"/>

Indicate the number of (a) individuals in your firm/agency with a BSCM or equivalent could benefit from the proposed Master program and (b) positions in your firm/agency that could be filled by the proposed master program graduates.

	0	1-2	3-5	6-8	>8
Number of individuals with a BSCM or equivalent who could benefit:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Number of positions that could be filled by CM master graduates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What is your overall assessment of this proposed program? Does it make sense? What are its strengths/limitations?

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Attachment D
MOUs from CGE and CSB

Sept 14, 2018

To: Professor Brad Hyatt, Department Chair of Construction Management, CSUF

From: Dr. Riadh Munjy, Department Chair of Civil & Geomatics Engineering, CSUF *R. Munjy*

Subj: Memorandum on Support for MSCM from Department of Civil & Geomatics Engineering

This Memorandum of Understanding details the support from the Department of Civil & Geomatics Engineering to the proposed new Master of Science program in Construction Management (MSCM).

1. CE210 Research Methods in Civil Engineering will be offered by faculty in the Department of Civil & Geomatics Engineering as part of the core courses in the proposed MSCM curriculum.
2. CE206 Engineering Environmental Impact will be listed as one of the electives. This course doesn't have prerequisites.
3. Dr. Arezoo Sadrinezhad will serve as part of the graduate faculty for the proposed MSCM program.

Sincerely,

Dr. Riadh Munjy

Department Chair of Civil & Geomatics Engineering, CSUF



Oct. 9, 2018

To: Professor Brad Hyatt, Department Chair of Construction Management
From: Dr. Harry Xia, Director of Graduate Business Programs
Subj: Proposal for collaboration between CSB and CM on a new MSCM program

On behalf of the Graduate Business Programs of the Craig School of Business (CSB), we would like to welcome the proposed collaboration with the Department of Construction Management (CM) in the Lyles College of Engineering to offer CSB courses to your new Master of Science program (MSCM) to start in Spring 2020, as stated in your letter dated Sept. 18, 2018.

Having consulted with our dean and the related department chairs, based on the expected enrollment suggested in your letter, we would like to confirm that:

1. MBA210 Leadership and Organizational Behavior will be included as part of the core courses in the proposed MSCM curriculum and will be taught by CSB faculty in its Graduate Business Programs. There will be no prerequisites for students in the proposed MSCM program to take MBA210.
2. The following FIN and MBA courses will be listed as business electives in the proposed MSCM curriculum and will be taught by CSB faculty. Considering the various backgrounds students in the proposed MSCM program may come from, we have further adjusted the prerequisites/recommendations of one course as indicated below. These requirements may be different from course catalog descriptions. CSB will issue permission numbers to those who have met the requirements.
 - FIN120 Principles of Finance - ACCT4A highly recommended
 - FIN123 Business Forecasting - DS 123 or an equivalent course determined by the Department of Finance and Business Law
 - FIN131 Entrepreneurial Finance - Prerequisites: MBA212 or FIN120
 - FIN186 Business and Real Estate Economics - No prerequisites
 - MBA212 Financial Management - Prerequisite: ACCT4A or MBA201
 - MBA213 Managerial Accounting - Prerequisites: ACCT4A or MBA201
 - MBA232 Seminar in Investments and Portfolio Management - Prerequisites: MBA212 or FIN120

Note that similar courses previously taken and counted towards another degree are excluded as you suggested.

Craig School of Business
California State University, Fresno
5245 North Backer Avenue M/S PB7 • Fresno, California 93740-8001
P 559.278.4981 www.craig.csufresno.edu

THE CALIFORNIA STATE UNIVERSITY

DISCOVERY. DIVERSITY. DISTINCTION.

Attached please find the sample course syllabus of MBA210 and MBA213 for your reference. The syllabi of the courses taught by Department of Finance and Business Law faculty were sent to Dr. Vivien Luo in early September by Dr. K. C. Chen.

Please review and let us know if additional information is needed for the proposed collaboration. Thank you for your proposal and consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'Harry Xia', with a long horizontal flourish extending to the right.

Dr. Harry Xia
Director of Graduate Business Programs

Attachment E

**Letters of Support from
the Department Chair and College Dean**

November 22, 2018

Dear Sir or Madam:

The Department of Construction Management is very excited to meet the ever increasing demand for mid-level construction professionals by offering a Masters of Science in Construction Management (MSCM). This program is created specifically to develop future leaders capable of researching and implementing ever-changing technologies and innovative management strategies to produce more value while minimizing waste for A/E/C organizations.

The MSCM is structured to minimize the impact on current the current course offerings by Department of Construction Management while leveraging courses within existing graduate programs at Fresno State. The MSCM program is structured to offer approximately three graduate level CM courses on an annual basis. This can be done within the existing cost structure of the BSCM program, which requires eight (8) elective courses to be offered on an annual basis. Therefore, the MSCM program would replace 3 of these electives, which would reduce the BSCM electives to 5 per academic year. This reduction is not anticipated to have an impact on the current time to graduation for BSCM students.

Finally, the faculty of the Department of Construction Management are in agreement that the new MSCM program is an important step forward. The faculty are fully supportive of this proposal and look forward to working together to make it successful.

I can be reached via phone (559-278-7735) or email (bhyatt@csufresno.edu) should you have any questions.

Sincerely,



Bradley A. Hyatt

P.E., LEED® AP

Associate Professor

Chair, Department of Construction Management

Department of Construction Management

California State University, Fresno • Engineering East, Rm 216
5241 North Maple Avenue M/S, EE94 • Fresno, California 93740-8029

P 559.278.6056

F 559.278.4475 www.FresnoState.edu

THE CALIFORNIA STATE UNIVERSITY

31 January 2019

To: James Marshall
Dean, Division of Research and Graduate Studies

From: Ram Nunna 
Dean, Lyles College of Engineering

Re: Proposed MS Program in Construction Management

The faculty in the Construction Management department have developed a strong proposal to establish a new MS degree program in Construction Management. I have reviewed their proposal and believe that the faculty have a sound plan for implementation.

In the proposal, the faculty have indicated that no new resources will be needed to implement the program. By rearranging their current course offerings, and by partnering with the Craig School of Business, they should be able to offer the required courses in a timely manner. We are however considering to add a new faculty position in the Construction Management department with a search beginning in Fall 2019. A final decision will be made before the end of the Spring 2019 semester.

I strongly recommend that this proposal be approved.

Thank you for your consideration.

CC: Brad Hyatt, Chair, Department of Construction Management
Dr. Vivien Luo, Associate Professor, Department of Construction Management

Attachment F

Catalog Statement Revision Request

GRADUATE PROGRAM

(master's degree, doctoral degree, certificate of advanced study,
Credential requiring graduate-level course work)

CATALOG STATEMENT REVISION REQUEST

Return original to:

*Division of Research and Graduate Studies
Thomas Administration Building, Room 130
Mail Stop TA 51*

Graduate Program: Master of Science in Construction Management
Department: Construction Management
Contact Person: Dr. Yupeng Luo
Phone: 559-278-1792
E-mail: viluo@csufresno.edu
Effective Term/Year: Spring 2020

PURPOSE OF FORM: To propose revision of a graduate program catalog statement (program description and/or requirements) as it appears in the University Catalog. The proposed program changes if approved will be binding on students who are advanced to candidacy under the new catalog statement. NOTE: Revisions in graduate courses and proposals for new graduate courses are submitted on separate forms available through the Division of Research and Graduate Studies, phone 8-2448.

INSTRUCTIONS: Use attachments to this sheet to indicate the changes that you propose. Make changes as space allows directly on a 8.5" x 11" xerographic copy of the entire page(s) of your graduate program statement (description/requirements) as it appears in the most recent University Catalog, including page numbers. Use "mock-up" style: cross out wording to be deleted; type new language in margins. If there is no sufficient space in the margins to type lengthy additions, designate inserts (a, b, c, etc.). Attach fully typed language for each insert on additional sheets. Address question on these instructions to the Dean, phone 8-2448.

Routine proposals for graduate program changes are reviewed by the Graduate Curriculum Subcommittee. Extensive, substantive changes are reviewed by the University Graduate Committee.

Those planning to propose a new or extensively revised graduate program (master's, doctoral, or certificate of advanced study), including a proposal for a revised or an additional option under an existing graduate degree, should schedule a meeting with the Research and Graduate Dean.

JUSTIFICATION: Explain why the proposed changes in the graduate program are needed. Attach additional pages as necessary. Special justification and approval are required for proposals to increase master's degree program units above 30 units in academic fields, and 60 units in professional fields. Such justification must include comparative information concerning similar programs at representative universities, and outline adherence to accreditation standards if applicable. Document the impact of the proposed change and/or any increased program units on program students and department resources.

CONSULTING SIGNATURES (if required)

In an effort to avoid misunderstandings, signatures must be obtained from those **departments potentially affected** by proposed changes(s).

I have read the catalog statement revision request and support the proposed change(s).

Yes No

If no, please explain your concern (s):

Department Chair (of department being consulted)

Department of Civil & Geomatics Eng.

Riadh Munir

Department Chair (typed name)

R. Munir

Department Chair Signature

11/16/2018

Date

Craig School of Business
Graduate Business Programs

Department

Harry Xia

Department Chair (typed name)

[Signature]
Department Chair Signature

12/11/2018

Date

REQUIRED SCHOOL SIGNATURES (verifies proposal has been approved)

Graduate Program Coordinator

Yupeng Luo

Typed Name

[Signature]
Signature

12-12-18

Date

Department Chair

Brad Hyatt

Typed Name

[Signature]
Signature

11/6/2018

Date

School Curriculum (or Credential) Committee Chair (if applicable)

Nagy Bengiamin

Typed Name

[Signature]
Signature

12/13/18

Date

School Dean

Ram Nunna

Typed Name

[Signature]
Signature

12 Feb 2019.

Date

- For committee use only -

**UNIVERSITY GRADUATE COMMITTEE/GRADUATE CURRICULUM
SUBCOMMITTEE REVIEW RECOMMENDATION:**

Request Approved

Request Denied

Request Deferred

Date of Action

Explanation:

Recommendation approved by:

Dean, Research and Graduate Studies/or designee

James Marshall

Typed Name

Signature

Date

Attachment G

New Graduate Course Requests

NEW GRADUATE COURSE REQUEST

Return original to:

Division of Research and Graduate Studies
Thomas Administration Building, Room 130
Mail Stop TA 51

Graduate Program: Master of Science in Construction Management
Department: Construction Management
Contact Person: Dr. Yubena Luo
Phone: 559-278-1792
E-mail: viluo@csufresno.edu
Effective Term/Year: Spring/2020

Use this form if your course is: (please select the box below that best describes your course)

- (a) new (never has been taught before)
 (b) conversion (break-out of a "topics" course as a new course)
 (c) significant change to an existing course
 (d) other _____

NOTE: If the changes you make on this form are different from what you submitted on your mock-ups to catalog, then you **must** revise your mock-ups and resubmit them to the catalog office.

If you wish to delete or make minor revisions to an existing graduate course, use the "Graduate Course Change or Deletion" form.

1. NEW COURSE:

Prefix/ Subject CM Catalog Number 220 Long Course Title Advanced Planning and Preconstruction Units Max/Total 3.0

Adv. Precon _____
Short Title (16 spaces maximum) for Printing

Letter _____
Grading Basis (Letter, CR/NC, SP, Mixed)

Course Classification (C/S#) C2

NOTE: If the proposed course has been offered previously as a topics course or is the expansion of an existing course, complete the following for the previous course:

Prefix/ Subject _____ Catalog Number _____ Long Course Title _____ Units Max/Total _____

Catalog Description of New Course: (40 words only, excluding prerequisite, lecture-lab hours)
Advanced study of preconstruction planning and organizing methods and procedures for defining a project, identifying potential issues, and achieving successful project outcomes. This course covers concept, scope, team assembly, budget and schedule development, constructability, and construction documentation review.

2. NEW COURSE QUESTIONS:

(Each item **must** be addressed; attach additional sheet(s) as needed.)

- A. How frequently is the new course expected to be offered? Every semester
- B. What is the expected enrollment? 10-15
- C. What is/are the mode(s) of course delivery (e.g., lecture, seminar, supervision, distance learning)? **Please see "Definitions of Graduate Level Instruction in the CSU."**
Lecture
- D. Identify all new resources (special facilities, library resources, technical assistance, etc.) needed to institute the course.

- E. Is this course required or elective? Required
- F. Is there another course(s) covering similar subject matter:
- Within your department? No Yes (if yes, complete section 4)
 - at California State University, Fresno? No Yes (if yes, complete section 4)
- G. Has this course been previously offered as a topics course? Yes No
If yes, how many times? _____
- H. Justification for New Course: (Please attach an explanation detailing the need for this new course.)

3. Please attach a course outline/syllabus that:

- Follows the guidelines stated in the "**Policy on Course Syllabi and Grading**" as published in the Academic Policy Manual 241.
- Illustrates how the course meets the criteria described in "**Definitions of Graduate Level Instruction in the CSU.**"

4. CONSULTING SIGNATURES (if required)

In an effort to avoid course duplication and misunderstandings, signatures must be obtained from those departments potentially affected by proposed changes.

I have read the new graduate course proposal and support the offering of this course.

Yes No

If no, please explain your concern (s):

Department Chair (of department being consulted)

Department

Department

Department Chair (typed name)

Department Chair (typed name)

Department Chair Signature

Department Chair Signature

Date

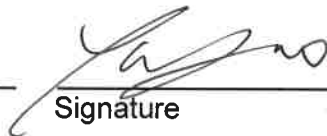
Date

5. REQUIRED SCHOOL SIGNATURES (verifies proposal has been approved)

Graduate Program Coordinator

Yupeng Luo

Typed Name


Signature

12-12-18

Date

Department Chair

Brad Hyatt

Typed Name


Signature

11/6/2018

Date

School Curriculum (or Credential) Committee Chair (if applicable)

Nagy Bengiamin

Typed Name


Signature

12/13/18

Date

School Dean

Ram Nunna

Typed Name


Signature

12 Feb 2019

Date

- For committee use only -

**UNIVERSITY GRADUATE COMMITTEE/GRADUATE CURRICULUM SUBCOMMITTEE REVIEW
RECOMMENDATION:**

Request Approved

Request Denied

Request Deferred

_____ **Date of Action**

Explanation:

Recommendation approved by:

Dean, Research and Graduate Studies/or designee

James Marshall

Typed Name

Signature

Date

NEW GRADUATE COURSE REQUEST

Return original to:

Division of Research and Graduate Studies
Thomas Administration Building, Room 130
Mail Stop TA 51

Graduate Program: Master of Science in Construction Management
Department: Construction Management
Contact Person: Dr. Yupeng Luo
Phone: 559-278-1792
E-mail: viluo@csufresno.edu
Effective Term/Year: Fall/2020

Use this form if your course is: (please select the box below that best describes your course)

- (a) new (never has been taught before)
- (b) conversion (break-out of a "topics" course as a new course)
- (c) significant change to an existing course
- (d) other _____

NOTE: If the changes you make on this form are different from what you submitted on your mock-ups to catalog, then you **must** revise your mock-ups and resubmit them to the catalog office.

If you wish to delete or make minor revisions to an existing graduate course, use the "Graduate Course Change or Deletion" form.

1. NEW COURSE:

Prefix/ Subject CM Catalog Number 230 Long Course Title Advanced Construction Operations Units Max/Total 3.0

Adv. Const Ops. Letter
Short Title (16 spaces maximum) for Printing Grading Basis (Letter, CR/NC, SP, Mixed)

Course Classification (C/S#) C2

NOTE: If the proposed course has been offered previously as a topics course or is the expansion of an existing course, complete the following for the previous course:

Prefix/ Subject _____ Catalog Number _____ Long Course Title _____ Units Max/Total _____

Catalog Description of New Course: (40 words only, excluding prerequisite, lecture-lab hours)
Introduction of production management concepts, techniques and tools to design, analyze, and improve core construction operational capabilities. Topics covered include lean production principles, lean construction principles, project control, risk pooling, and quality management.

2. NEW COURSE QUESTIONS:

(Each item **must** be addressed; attach additional sheet(s) as needed.)

- A. How frequently is the new course expected to be offered? Every other semester
- B. What is the expected enrollment? 10-15
- C. What is/are the mode(s) of course delivery (e.g., lecture, seminar, supervision, distance learning)? **Please see "Definitions of Graduate Level Instruction in the CSU."**
Lecture
- D. Identify all new resources (special facilities, library resources, technical assistance, etc.) needed to institute the course.
- E. Is this course required or elective? Required
- F. Is there another course(s) covering similar subject matter:
- Within your department? No Yes (if yes, complete section 4)
 - at California State University, Fresno? No Yes (if yes, complete section 4)
- G. Has this course been previously offered as a topics course? Yes No
If yes, how many times?
- H. Justification for New Course: (Please attach an explanation detailing the need for this new course.)

This is a core course for a new Master of Science Program in Construction Management.

3. Please attach a course outline/syllabus that:

- Follows the guidelines stated in the "**Policy on Course Syllabi and Grading**" as published in the Academic Policy Manual 241.
- Illustrates how the course meets the criteria described in "**Definitions of Graduate Level Instruction in the CSU.**"

4. CONSULTING SIGNATURES (if required)

In an effort to avoid course duplication and misunderstandings, signatures must be obtained from those departments potentially affected by proposed changes.

I have read the new graduate course proposal and support the offering of this course.

Yes No

If no, please explain your concern (s):

Department Chair (of department being consulted)

Department

Department

Department Chair (typed name)

Department Chair (typed name)

Department Chair Signature

Department Chair Signature

Date

Date

5. REQUIRED SCHOOL SIGNATURES (verifies proposal has been approved)

Graduate Program Coordinator

Yupeng Luo

Typed Name

Signature

12-11-2018

Date

Department Chair

Brad Hyatt

Typed Name

Signature

12/11/2018

Date

School Curriculum (or Credential) Committee Chair (if applicable)

Nagy Bengiamin

Typed Name

Signature

12/13/18

Date

School Dean

Ram Nunna

Typed Name

Signature

12 Feb 2019

Date

- For committee use only -

**UNIVERSITY GRADUATE COMMITTEE/GRADUATE CURRICULUM SUBCOMMITTEE REVIEW
RECOMMENDATION:**

Request Approved

Request Denied

Request Deferred

Date of Action

Explanation:

Recommendation approved by:

Dean, Research and Graduate Studies/or designee

James Marshall

Typed Name

Signature

Date

NEW GRADUATE COURSE REQUEST

Return original to:

Division of Research and Graduate Studies
Thomas Administration Building, Room 130
Mail Stop TA 51

Graduate Program: Master of Science in Construction Management
Department: Construction Management
Contact Person: Dr. Yupeng Luo
Phone: 559-278-1792
E-mail: viluo@csufresno.edu
Effective Term/Year: Fall/2020

Use this form if your course is: (please select the box below that best describes your course)

- (a) new (never has been taught before)
 (b) conversion (break-out of a "topics" course as a new course)
 (c) significant change to an existing course
 (d) other _____

NOTE: If the changes you make on this form are different from what you submitted on your mock-ups to catalog, then you **must** revise your mock-ups and resubmit them to the catalog office.

If you wish to delete or make minor revisions to an existing graduate course, use the "Graduate Course Change or Deletion" form.

1. NEW COURSE:

Prefix/ Catalog Long Course
Subject CM Number 240 Title Advanced Construction Business Strategy Units Max/Total 3.0

Adv Con BusStrat Letter
Short Title (16 spaces maximum) for Printing Grading Basis (Letter, CR/NC, SP, Mixed)

Course Classification (C/S#) C2

NOTE: If the proposed course has been offered previously as a topics course or is the expansion of an existing course, complete the following for the previous course:

Prefix/ Catalog Long Course
Subject _____ Number _____ Title _____ Units Max/Total _____

Catalog Description of New Course: (40 words only, excluding prerequisite, lecture-lab hours)
Introduction of strategic management activities that affect profitability on construction projects and within a construction company. Inherent risks are discussed in detail. Case studies are used to identify potential risks and to apply methods to mitigate those risks.

2. NEW COURSE QUESTIONS:

(Each item **must** be addressed; attach additional sheet(s) as needed.)

- A. How frequently is the new course expected to be offered? Every other semester
- B. What is the expected enrollment? 10-15
- C. What is/are the mode(s) of course delivery (e.g., lecture, seminar, supervision, distance learning)? **Please see "Definitions of Graduate Level Instruction in the CSU."**
Lecture
- D. Identify all new resources (special facilities, library resources, technical assistance, etc.) needed to institute the course.

- E. Is this course required or elective? Required
- F. Is there another course(s) covering similar subject matter:
- Within your department? No Yes (if yes, complete section 4)
 - at California State University, Fresno? No Yes (if yes, complete section 4)
- G. Has this course been previously offered as a topics course? Yes No
If yes, how many times? _____
- H. Justification for New Course: (Please attach an explanation detailing the need for this new course.)

This is a core course for a new Master of Science Program in Construction Management.

3. Please attach a course outline/syllabus that:

- Follows the guidelines stated in the "**Policy on Course Syllabi and Grading**" as published in the Academic Policy Manual 241.
- Illustrates how the course meets the criteria described in "**Definitions of Graduate Level Instruction in the CSU.**"

4. CONSULTING SIGNATURES (if required)

In an effort to avoid course duplication and misunderstandings, signatures must be obtained from those departments potentially affected by proposed changes.

I have read the new graduate course proposal and support the offering of this course.

Yes No

If no, please explain your concern (s):

Department Chair (of department being consulted)

Department

Department

Department Chair (typed name)

Department Chair (typed name)

Department Chair Signature

Department Chair Signature

Date

Date

5. REQUIRED SCHOOL SIGNATURES (verifies proposal has been approved)

Graduate Program Coordinator

Yupeng Luo

Typed Name

Signature

12-11-2018

Date

Department Chair

Brad Hyatt

Typed Name

Signature

12/11/2018

Date

School Curriculum (or Credential) Committee Chair (if applicable)

Nagy Bengiamin

Typed Name

Signature

12/13/18

Date

School Dean

Ram Nunna

Typed Name

Signature

12 Feb 2019

Date

- For committee use only -

**UNIVERSITY GRADUATE COMMITTEE/GRADUATE CURRICULUM SUBCOMMITTEE REVIEW
RECOMMENDATION:**

Request Approved

Request Denied

Request Deferred

Date of Action

Explanation:

Recommendation approved by:

Dean, Research and Graduate Studies/or designee

James Marshall

Typed Name

Signature

Date

Attachment H

CM220 Advanced Preconstruction Services

CM220 Advanced Planning and Preconstruction

Introduction to Course & Instructor

SYLLABUS FOR ADVANCED PLANNING AND PRECONSTRUCTION	
Spring 2020	California State University, Fresno
Course Number: TBD	Instructor: TBD
Units: 3.0	Office Number: TBD
Time: TBD	E-Mail: TBD <i>Please allow 3 business days for response to e-mails.</i>
Location: TBD	Telephone: TBD
Website: To access the course login to Canvas (https://fresnostate.instructure.com/) using your Fresno State username and password. For help with Canvas contact Academic Technology Resource Center at 278-7373 or send an email to canvas@mail.fresnostate.edu	Office Hours: TBD
CM Department Information Office: EE 218 Telephone: 559-278-6056 Fax: 559-278-4475	

Course Description:

Advanced study of preconstruction planning and organizing methods and procedures for defining a project, identifying potential issues, and achieving successful project outcomes. This course covers concept, scope, team assembly, budget and schedule development, constructability, and construction documentation review.

Prerequisites

There are no prerequisites for this course but a working knowledge of the construction industry will be needed to participate in the class discussions and to perform the course projects.

Required Textbooks and Recommended Materials

- No required textbooks. Reading materials and videos on key topics will be posted online.
- Recommended reference:
 - Construction Project Management, Clough and Sears, John Wiley & Sons, 5th ed.

Course Goals and Primary Learning Outcomes

Course Goals:

The preconstruction phase is crucial to the success of a construction project. It is the phase of developing a solution based on the cost, time, and quality goals that were established in the strategic phase of the project. Students will learn and practice advanced planning and organizing methods and procedures to define a project, identify potential issues, and achieving successful project outcomes. Students entering this course are expected to have knowledge of the construction industry, project delivery processes, and construction means and methods.

Program Learning Outcomes (PLOs):

This course addresses the following PLOs, and will directly assess PLOs #1 and #3.

PLOs#	Level (I/R/E/M)	Direct Assessment (Y/N)	Outcome Description
1	M	Y	Problem solving and decision making
2	R	N	Effective and professional oral and written communication
3	I	Y	Use of information and communication technology

I = introduced, R = Reinforced, E = Emphasized, M = Mastered

Primary Course Student Learning Outcomes (SLOs):

This course has the following primary SLOs, and will directly assess SLOs #1, #2, and #3.

SLOs#	Level (I/R/E/M)	Direct Assessment (Y/N)	Outcome Description
1	I	Y	Discuss critical activities in the early stages of a project before actual construction begins.
2	I	Y	Demonstrate knowledge of the role of information processing in project planning and control and the ability to apply BIM.
3	I	Y	Establish project goals and develop strategies to mitigate potential risks.

I = introduced, R = Reinforced, E = Emphasized, M = Mastered

Course Assessment Matrix

This course aligns SLOs with PLOs assessment. The table below specifies the mapping between SLOs and PLOs, the assessment measures for those that will be directly assessed, minimum standards and assessment targets.

SLOs #	PLOs #	Assessment Measures (2 min)		Minimum Standards	Assessment Targets
		Direct Measures (DM, 1 min.)	Indirect Measures (IM)		
1	2	DM1: Team Deliverable DM2: Individual Research Presentation	None	DM1 & DM2: 70% or more	DM1 & DM2: 80% or more
2	3	DM1: Individual Deliverable DM2: Team Deliverable	None	DM1 & DM2: 70% or more	DM1 & DM2: 80% or more
3	1	DM1: Individual Deliverable DM2: Online Quiz	None	DM1 & DM2: 70% or more	DM1 & DM2: 80% or more

Course Organization

This course uses classroom demonstration, case-based individual & team exercises, and computer software to demonstrate key activities in various phases of preconstruction.

Major Assignments

Class Participation, Individual & Team Deliverables:

Regular class attendance is the best way to learn the materials of this course. There will be a number of in-class individual and team exercises based on assigned case studies throughout the

semester. Class attendance and completion of these exercises will contribute to your grade. These activities are designed to develop and reinforce the concepts covered in class as well as to encourage and reward ongoing involvement in class.

There will be NO make-up class activities without authorized excuses. Students can make written requests to the instructor for an extension of deliverables or rescheduling of quizzes if legitimate excuses are provided and validated.

Research Project:

Each student will select a current topic in project planning and preconstruction, study in depth, and share the findings in a 10-min class presentation at the end of the semester.

Online Quizzes:

Students are expected to complete assigned readings/videos and be prepared for each class. A number of online quizzes will be assigned throughout the semester based on related readings/videos.

Grading

Each student will be required to complete all the course assignments. If you are absent from class, it is your responsibility to check on announcements made while you were away. Here is a summary of the grading for the course:

Class Participation	10%
Individual Deliverables on Case Projects	20%
Online Quizzes	20%
Individual Research Presentation	20%
Team Deliverables on Case Projects	30%
TOTAL	100%
(A: 90% or Above; B: 80% to 89.9%; C: 70% - 79.9%; D: 60% - 69.9%; F: Below 60%)	

Assignment and examination schedule

Week # Due	Assignment	Points/Percent
2	Online Quiz 1	100/4%
3	Online Quiz 2	100/4%
4	Online Quiz 3	100/4%
5	Case Project 1 - Individual Deliverables	100/6.67%
6	Case Project 1 - Team Deliverables	100/7.5%
7	Online Quiz 4	100/4%

8	Case Project 2 - Individual Deliverables	100/6.67%
9	Case Project 2 - Team Deliverables	100/7.5%
10	Online Quiz 5	100/4%
11	Case Project 3 - Individual Deliverables	100/6.67%
13	Case Project 3 - Team Deliverables	100/7.5%
14,15	Individual Research Presentation	100/20%
15	Team Binder Submission	100/7.5%

Course Policies

Attendance: Attendance is mandatory due to the nature of this course. The instructor will take roll at the beginning and/or the end of each class. **Three late arrivals or early departures will constitute one unexcused absence. Any student who misses classes six or more times through any combination of excused or unexcused absences will not receive credit for this course. These students should withdraw from the course.** Any missed quizzes or assignments remain the responsibility of the student (See “Student Affairs” section of the California State University, Fresno General Catalog). Students should contact the instructor regarding any absences, especially when there are extended absences due to illness, death in the immediate family, or other situations. In an emergency, students may contact the Dean of Students.

Communication/Assignment Policy: Please refer to the University Policy in the semester catalogue regarding Email communication. This course will be utilizing the **Canvas** for mostly announcements, assignments, and lecture notes. **Students are expected to check Canvas every other day at the very minimum.** The website is <https://fresnostate.instructure.com/>. If you are absent from class, it is your responsibility to check on announcements made while you were away. If a student misses a class and still has questions about lecture material, it is the student’s responsibility to contact the professor.

Etiquette: All class participants are expected to act professionally at all times. At a minimum, this shall include:

- Show up to class on time. Leave when the instructor has dismissed the class.
- Refrain from using cell phones or doing any activities irrelevant/disruptive during class periods.
- Actively participate in class activities.
- Treat all members of the class with respect.
- Complete assignments on time.
- Be a good team member.

University Policies

Students with Disabilities:

Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in the Henry Madden Library, Room 1202 (278-2811).

Honor Code:

“Members of the CSU Fresno academic community adhere to principles of academic integrity and mutual respect while engaged in university work and related activities.” You should:

- a) understand or seek clarification about expectations for academic integrity in this course (including no cheating, plagiarism and inappropriate collaboration)
- b) neither give nor receive unauthorized aid on examinations or other course work that is used by the instructor as the basis of grading.
- c) take responsibility to monitor academic dishonesty in any form and to report it to the instructor or other appropriate official for action.

Instructors may require students to sign a statement at the end of all exams and assignments that “I have done my own work and have neither given nor received unauthorized assistance on this work.” If you are going to use this statement, include it here.

Cheating and Plagiarism:

"Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work." Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University's policy regarding cheating and plagiarism, refer to the Class Schedule (Legal Notices on Cheating and Plagiarism) or the University Catalog (Policies and Regulations).

Computers:

"At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. Every student is required to have his/her own computer or have other personal access to a workstation (including a modem and a printer) with all the recommended software. The minimum and

recommended standards for the workstations and software, which may vary by academic major, are updated periodically and are available from [Information Technology Services](http://www.csufresno.edu/ITS/) (<http://www.csufresno.edu/ITS/>) or the University Bookstore. In the curriculum and class assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources."

Disruptive Classroom Behavior:

"The classroom is a special environment in which students and faculty come together to promote learning and growth. It is essential to this learning environment that respect for the rights of others seeking to learn, respect for the professionalism of the instructor, and the general goals of academic freedom are maintained. ... Differences of viewpoint or concerns should be expressed in terms which are supportive of the learning process, creating an environment in which students and faculty may learn to reason with clarity and compassion, to share of themselves without losing their identities, and to develop and understanding of the community in which they live . . . Student conduct which disrupts the learning process shall not be tolerated and may lead to disciplinary action and/or removal from class."

Copyright Policy:

Copyright laws and fair use policies protect the rights of those who have produced the material. The copy in this course has been provided for private study, scholarship, or research. Other uses may require permission from the copyright holder. The user of this work is responsible for adhering to copyright law of the U.S. (Title 17, U.S. Code). To help you familiarize yourself with copyright and fair use policies, the University encourages you to visit its [Copyright Web Page](http://csufresno.edu/library/information/copyright/) (<http://csufresno.edu/library/information/copyright/>).

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For free tutoring on campus, contact the Learning Center

(<http://fresnostate.edu/studentaffairs/lrc>) in the Collection Level (basement level) of the Henry Madden Library. You can reach them by phone at 559.278.3052.

Our campus has developed SupportNet (<http://fresnostate.edu/studentaffairs/lrc/supportnet>) to connect students with specific campus resources promoting academic success. Students may be

referred to it if you believe they need the services provided by SupportNet to succeed in your course.

Subject to Change Statement

The syllabus and schedule for this course are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent. The announcement will be done orally in class or published electronically in Canvas.

Tentative Course Schedule

Week#	Topic	Assignments
1	Introduction to Construction Project Management Cycle and Preconstruction Services	
2	Integrated Project Delivery & the Role of CM	Online Readings, Quiz 1
3	Information Processing during Project Planning Process BIM Application	Online Readings, Quiz 2
4	Conceptual Phase <ul style="list-style-type: none"> • Develop Master Schedule • Allocate Project Budget • Establish Permits/Approvals Process • Establish Reporting and Accounting Procedures • Develop Cash Flow Analysis • Develop Phased Construction Schedule • Develop Procurement Plan • Sustainability/LEED Planning • BIM Coordination/Integration 	Online Readings, Quiz 3 Case projects #1 assigned
5	Conceptual Phase Individual Activities	Individual deliverables
6	Conceptual Phase Team Activities	Team deliverables
7	Design Development Phase <ul style="list-style-type: none"> • Establish General Conditions • Define Logistics Plans • Analyze Budget / Design / Needs • Risk Analysis • Life Cycle Cost Analysis • Sustainability/LEED Planning • BIM Coordination/Integration 	Online Readings, Quiz 4 Case projects #2 assigned
8	Design Development Individual Activities	Individual deliverables
9	Design Development Team Activities	Team deliverables
10	Construction Documents Phase <ul style="list-style-type: none"> • Constructability Review • Health & Safety Plan • Bid Packaging and Procurement Strategies • Collaborative Scheduling/Pull Planning • Construction Documents Review • Establish Owner Occupancy Schedule • BIM Coordination/Integration 	Online readings, Quiz 5 Case projects #3 assigned
11	Construction Documents Phase Individual Activities	Individual deliverables
12	Construction Documents Phase Team Activities	
13	Construction Documents Phase Team Activities	Team deliverables
14	Individual Research Presentations	
15	Individual Research Presentations	Team binder submission

Attachment I

CM230 Advanced Construction Operations

CM230 Advanced Construction Operations

Introduction to Course & Instructor

SYLLABUS FOR ADVANCED CONSTRUCTION OPERATIONS	
Fall 2020	California State University, Fresno
Course Number: TBD	Instructor: TBD
Units: 3.0	Office Number: TBD
Time: TBD	E-Mail: TBD <i>Please allow 3 business days for response to e-mails.</i>
Location: TBD	Telephone: TBD
Website: To access the course login to Canvas (https://fresnostate.instructure.com/) using your Fresno State username and password. For help with Canvas contact Academic Technology Resource Center at 278-7373 or send an email to canvas@mail.fresnostate.edu	Office Hours: TBD
CM Department Information Office: EE 218 Telephone: 559-278-6056 Fax: 559-278-4475	

Course Description:

Introduction of production management concepts, techniques and tools to design, analyze, and improve core construction operational capabilities. Topics covered include lean production principles, lean construction principles, project control, risk pooling, and quality management.

Prerequisites

There are no prerequisites for this course but a working knowledge of the construction industry will be needed to participate in the class discussions and to perform the course projects.

Required Textbooks and Recommended Materials

- Required Text: Lean Thinking: Banish Waste and Create Wealth in Your Corporation. J. P. Womack & D. T. Jones. Simon & Shuster: New York. 2003. ISBN 0-7432-4927-5.
- Recommended references:
 - Modern Construction: Lean Project Delivery and Integrated Practices, Lincoln H. Forbes and Syed M. Ahmed, CRC Press. 2010.
 - Construction Project Management, Clough and Sears, John Wiley & Sons, 5th ed.

Course Goals and Primary Learning Outcomes

Course Goals:

Students entering this course are expected to have knowledge of the construction industry, project delivery processes, and construction means and methods.

This course explores the use of production management to efficiently manage the delivery processes of construction projects. Students will learn about fundamental models of managing project processes and tools to manage projects as production systems. The procurement, design, and construction processes that are used in construction projects are not usually thought of in production process terms. Yet, doing so can develop a deeper understanding of the complexities of construction projects and enable project production to be efficiently managed. Production management emphasizes managing projects as complex wholes focusing on the relationships between the parties and tasks to optimize total process performance.

Program Learning Outcomes (PLOs):

This course addresses the following PLOs, and will directly assess PLOs #4 and #6.

PLOs#	Level (I/R/E/M)	Direct Assessment (Y/N)	Outcome Description
3	R	N	Use of information and communication technology
4	I	Y	Principles of leadership in business and management
6	E	Y	Advanced construction management practices

I = introduced, R = Reinforced, E = Emphasized, M = Mastered

Primary Course Student Learning Outcomes (SLOs):

This course has the following primary SLOs, and will directly assess SLOs #1, #2, #3, & #4.

SLOs#	Level (I/R/E/M)	Direct Assessment (Y/N)	Outcome Description
1	I	Y	Understand how principles of production relate to construction projects;
2	I	Y	Understand the principles and methods of new production management methods like lean construction.
3	I	Y	Apply specific production management tools to specific problems identified on construction projects.
4	I	Y	Understand how to use the latest production management planning and control tools to improve the management of construction projects

I = introduced, R = Reinforced, E = Emphasized, M = Mastered

Course Assessment Matrix

This course aligns course SLOs with PLOs assessment. The table below specifies the mapping between SLOs and PLOs, the assessment measures for those that will be directly assessed, minimum standards and assessment targets.

SLOs #	PLOs #	Assessment Measures (2 min)		Minimum Standards	Assessment Targets
		Direct Measures (DM, 1 min.)	Indirect Measures (IM)		
1		DM1: Online Quiz DM2: Homework Assignment	None	DM1 & DM2: 70% or more	DM1 & DM2: 80% or more
2	4	DM1: Research Project DM2: Homework Assignment	None	DM1 & DM2: 70% or more	DM1& DM2: 80% or more
3	3	DM1: Journal Assignment DM2: Production Lab Simulations	None	DM1 & DM2: 70% or more	DM1& DM2: 80% or more
4	6	DM1: Term Project Production Manual DM2: Research Project	None	DM1 & DM2: 70% or more	DM1& DM2: 80% or more

Course Organization

This course uses classroom demonstration, case-based materials, in-class game simulation, and computer software to demonstrate key concepts and production tool applications. Assessment is conducted through out-of-class assignments, homework exercises, and major project(s) requiring

students to develop a production control manual to enable diagnosis of production problems on a project and assign the appropriate tool to remedy the problem.

Major Assignments

Class Participation and Homework:

Regular class attendance is the best way to learn the materials of this course. There will be a number of in-class quizzes, exercises, and homework assignments throughout the semester. Participation and completion of these will contribute to your grade. These activities are designed to develop and reinforce the concepts covered in class as well as to encourage and reward ongoing involvement in class.

There will be NO make-up class activities without authorized excuses. Students can make written requests to the instructor for an extension of deliverables if legitimate excuses are provided and validated.

Production Assignment and Journal:

This is a group project where students devise a detailed production plan and test a series of production management principle. The tests and theory will be tracked and documented in a journal.

- **Journal:**

This class seeks to engage students to develop lifelong skills for evaluating and developing means and methods to resolve problems focused on production. One of the key developmental steps is how students connect the theory discussed in class with the practical production management efforts applied in the field. The journal assignment is intended to provide an ongoing means of documenting this journey and sharing the challenges and insights with the course instructor.

- **Production Lab Simulations:**

As the theory within the coursework develops, students will engage in a series of controlled production assessments. The team will need to use a consistent workspace to refine the production tasks for each step, record, and analyze the production activity to document changes with each stage. The experiment procedures will be documented individually in the Journal, and the questions associated with each stage will be captured as a discussion and reflection therein.

Research Project:

This class seeks to delve into the leading edge of production management approaches and theory. A current topic in production management will be chosen for the class to study in depth. The topic will be broken into subsections and the project teams will work to develop a summary and practical guide for using the concepts on construction project management.

Group Project – Term Production Manual:

The group project will develop the production view of construction through the investigation and analysis of the processes of a current building project. Students will be asked to describe a building process, observe the inefficiencies in this process and provide tools to address these inefficiencies. A decision making framework will be developed and employed in a case study example. The class will be broken into groups consisting of, typically, three students. More details will be provided when the project is issued.

Grading

Each student will be required to complete all the course assignments. If you are absent from class, it is your responsibility to check on announcements made while you were away. Here is a summary of the grading for the course:

Class Participation and Homework	20%
Research Project	20%
Production Lab Simulations	15%
Journal Assignments	15%
Term Project Production Manual	30%

TOTAL 100%
(A: 90% or Above; B: 80% to 89.9%; C: 70% - 79.9%; D: 60% - 69.9%; F: Below 60%)

Assignment and examination schedule

Week # Due	Assignment	Points/Percent
3	Production Lab Simulation 1	100/3%
	Journal 1	100/3%
6	Production Lab Simulation 2	100/3%
	Journal 2	100/3%
8	Production Manual I	100/10%
9	Production Lab Simulation 3	100/3%
	Journal 3	100/3%
12	Production Manual II	100/10%
	Production Lab Simulation 4	100/3%
	Journal 4	100/3%
8-12	Research Project	100/20%
15	Production Manual III	100/10%
	Production Lab Simulation 5	100/3%
	Journal 5	100/3%

Course Policies

Attendance: Attendance is mandatory due to the nature of this course. The instructor will take roll at the beginning and/or the end of each class. **One letter grade will be deducted with every third unexcused absence. Three late arrivals or early departures will constitute one unexcused absence. Any student who misses classes six or more times through any combination of excused or unexcused absences will not receive credit for this course. These students should withdraw from the course.** Any missed quizzes or assignments remain the responsibility of the student (See “Student Affairs” section of the California State University, Fresno General Catalog). Students should contact the instructor regarding any absences, especially when there are extended absences due to illness, death in the immediate family, or other situations. In an emergency, students may contact the Dean of Students.

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Etiquette: All class participants are expected to act professionally at all times. At a minimum, this shall include:

- Show up to class on time. Leave when the instructor has dismissed the class.
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- Actively participate in class activities.
- Treat all members of the class with respect.
- Complete assignments on time.
- Be a good team member.

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Cheating and Plagiarism:

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in terms which are supportive of the learning process, creating an environment in which students and faculty may learn to reason with clarity and compassion, to share of themselves without losing their identities, and to develop and understanding of the community in which they live . . . Student conduct which disrupts the learning process shall not be tolerated and may lead to disciplinary action and/or removal from class."

Copyright Policy:

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Tentative Course Schedule

Week#	Topic	Assignments
1	Introduction to Construction Project Management	
2	IT Applications and Trends in Construction Management	Online Readings
3	Role of Information in Decision Making Process	Production Lab Simulation 1 Journal 1
4	Construction as a Production System Systematic Process Modeling of Projects	Online Readings
5	Measuring Project Performance Data Collection Tools	Online Readings, Research Project Assigned
6	Lean Construction: The Production Revolution	Text - Intro + Ch. 1 & 2 Production Lab Simulation 2 Journal 2
7	Project Delivery Systems Building Projects of Value: Lego Tower	Online Readings
8	From Batch to Flow	Text - Ch. 3 Research Project Team Summary Production Manual - Submittal I
9	Value Stream Mapping / Big Picture Mapping Pull Production: Making Flow Efficient	Text - Ch. 4 Research Project Team Summary Production Lab Simulation 3 Journal 3
10	Planning Tools: Last Planner, Perfection, Standardized Work	Text - Ch. 5 Research Project Team Summary
11	Quality Circles / Ohno Circles 5S's / Spaghetti Diagrams First Run Study / Gemba Walk	Text - Ch. 6 Research Project Team Summary
12	House of Quality / Swarming Set-Based Design / CBA	Text - Ch. 7 Production Manual - Submittal II Research Project Team Summary Production Lab Simulation 4 Journal 4
13	Project Time	
14	Production Manual - Presentations	
15	Production Manual - Presentations	Production Manual - Submittal III Production Lab Simulation 5 Journal 5

Attachment J

CM240 Advanced Construction Business Strategy

CM240 Advanced Construction Business Strategy

Introduction to Course & Instructor

SYLLABUS FOR ADVANCED CONSTRUCTION BUSINESS STRATEGY	
Fall 2020	California State University, Fresno
Course Number: TBD	Instructor: TBD
Units: 3.0	Office Number: TBD
Time: TBD	E-Mail: TBD <i>Please allow 3 business days for response to e-mails.</i>
Location: TBD	Telephone: TBD
Website: To access the course login to Canvas (https://fresnostate.instructure.com/) using your Fresno State username and password. For help with Canvas contact Academic Technology Resource Center at 278-7373 or send an email to canvas@mail.fresnostate.edu	Office Hours: TBD
CM Department Information Office: EE 218 Telephone: 559-278-6056 Fax: 559-278-4475	

Course Description:

Introduction of strategic management activities that affect profitability on construction projects and within a construction company. Inherent risks are discussed in detail. Case studies are used to identify potential risks and to apply methods to mitigate those risks.

Prerequisites

There are no prerequisites for this course but a working knowledge of the construction industry will be needed to participate in the class discussions and to perform the course projects.

Required Textbooks and Recommended Materials

- Essentials of Strategic Management, 5th Edition by David Hunger and Thomas Wheelen
- A package of case studies will be also distributed by the instructor at the beginning of the semester.
- Additional course handouts and readings will be posted to Canvas.

Course Goals and Primary Learning Outcomes

Course Goals:

The goal for this course is to develop in each student a set of skills for analyzing and designing effective organization strategies, structures and processes for companies within the construction industry.

Program Learning Outcomes (PLOs):

This course addresses the following PLOs, and will directly assess PLOs #1, #5, and #6.

PLOs#	Level (I/R/E/M)	Direct Assessment (Y/N)	Outcome Description
1	M	Y	Problem solving and decision making
5	E	Y	Professional ethics including application to situations and choices
6	M	Y	Advanced construction management practices

I = introduced, R = Reinforced, E = Emphasized, M = Mastered

Primary Course Student Learning Outcomes (SLOs):

This course has the following primary SLOs, and will directly assess SLOs #1, #3, and #5.

SLOs#	Level (I/R/E/M)	Direct Assessment (Y/N)	Outcome Description
1	I	Y	Develop a strategic plan for a company in the construction industry
2	I	N	Perform an internal evaluation of a company and assess their competitive advantages and core competencies
3	I	Y	Identify and evaluate new market opportunities for construction companies and potential market threats.
4	I	N	Understand organizational theory and its application to the construction industry.
5	I	Y	Understand the design of construction project organizations and the managerial challenges related to these dynamic, short term organizations.

I = introduced, R = Reinforced, E = Emphasized, M = Mastered

Course Assessment Matrix

This course aligns SLOs with PLOs assessment. The table below specifies the mapping between SLOs and PLOs, the assessment measures for those that will be directly assessed, minimum standards and assessment targets.

SLOs #	PLOs #	Assessment Measures (2 min)		Minimum Standards	Assessment Targets
		Direct Measures (DM, 1 min.)	Indirect Measures (IM)		
1	1	DM1: Corporate Strategy Planning Assignment, Part 2 DM2: Online Quiz	None	DM1 & DM2: 70% or more	DM1 & DM2: 80% or more
2	6				
3	6	DM1: Corporate Strategy Planning Assignment, Part 1 DM2: Case Study	None	DM1 & DM2: 70% or more	DM1 & DM2: 80% or more
4	5				
5	5	DM1: Case Study DM2: Online Quiz	None	DM1 & DM2: 70% or more	DM1 & DM2: 80% or more

Course Organization

The course will be taught via a combination of teaching methods including 1) Lectures by faculty and industry experts, 2) Company case studies, and 3) Assignments and exercises.

Major Assignments

Corporate Strategy Case Study Assignment:

To understand the strategic planning process, it is important to practice this process. Students will analyze a company within the construction industry and develop a strategic plan for the company. The case study assignment will be in three sections. Section one will be the development of an internal analysis for the company. Section two will focus on the external factors, including new market analysis and competition. The final section will be to develop a written case study for your project. This case study will be distributed to remainder of the class for review prior to a final group presentation.

Individual Position Paper / Self-developed Case Study:

There are many unresolved research issues within the area of strategic management in construction. Each student will select a topic of interest to analyze in detail. This topic could be one of the issues that we discuss in class or another related topic that we do not address in class. Each student will develop a paper to define the issue and different points of view; discuss the current status of research related to the issue; and develop their position related to the issue. Alternatively, a student can also select to develop a case study related to a topic in the course. Each student will develop an 8 minute presentation to be given in the last week of class on their issue.

Case Study Assignments:

Several case study assignments will be provided throughout the course. The case studies will help students practice the analysis of a company within the construction industry and develop a strategic direction for the company.

Online Quizzes:

Weekly online reading quizzes will be posted on Canvas throughout the semester. You are expected to complete assigned readings/videos and be prepared for each class. Quizzes will be due at the beginning of a class.

There will be NO make-up class activities without authorized excuses. Students can make written requests to the instructor for an extension of deliverables or rescheduling of quizzes if legitimate excuses are provided and validated.

Grading

Each student will be required to complete all the course assignments. If you are absent from class, it is your responsibility to check on announcements made while you were away. Here is a summary of the grading for the course:

Corporate Strategy Planning Assignment:

Part 1 – Internal/External Analysis	20%
Part 2 – Final Strategic Plan Analysis	20%
Individual Position Paper / Self-developed Case Study	30%
Case Study Assignments	20%
Online Quizzes	10%

TOTAL

100%

(A: 90% or Above; B: 80% to 89.9%; C: 70% - 79.9%; D: 60% - 69.9%; F: Below 60%)

Assignment and examination schedule

Week # Due	Assignment	Points/Percent
2	Online Quiz 1	100/1%
3	Online Quiz 2	100/1%
4	Online Quiz 3 Case Study 1	100/1% 100/2.5%
5	Online Quiz 4 Case Study 2	100/1% 100/2.5%
6	Online Quiz 5 Case Study 3 Corporate Strategy Planning Analysis, Part I	100/1% 100/2.5% 100/20%
7	Online Quiz 6 Case Study 4	100/1% 100/2.5%
8	Online Quiz 7 Case Study 5	100/1% 100/2.5%
9	Online Quiz 8 Case Study 6	100/1% 100/2.5%
10	Online Quiz 9 Case Study 7	100/1% 100/2.5%
11	Online Quiz 10 Case Study 8	100/1% 100/2.5%
13	Corporate Strategy Planning Analysis, Part II	100/20%
14-15	Individual Position Paper / Self-developed Case Study	100/30%

Course Policies

Attendance: Although attendance is not included in the grading, it is mandatory due to the nature of this course. The instructor will take roll at the beginning and/or the end of each class. **One letter grade will be deducted with every third unexcused absence. Three late arrivals or early departures will constitute one unexcused absence. Any student who misses classes six or more times through any combination of excused or unexcused absences will not receive credit for this course. These students should withdraw from the course.** Any missed quizzes or assignments remain the responsibility of the student (See “Student Affairs” section of the California State University, Fresno General Catalog). Students should contact the instructor regarding any absences, especially when there are extended absences due to illness, death in the immediate family, or other situations. In an emergency, students may contact the Dean of Students.

Communication/Assignment Policy: Please refer to the University Policy in the semester catalogue regarding Email communication. This course will be utilizing the **Canvas** for mostly announcements, assignments, and lecture notes. **Students are expected to check Canvas every other day at the very minimum.** The website is <https://fresnostate.instructure.com/>. If you are absent from class, it is your responsibility to check on announcements made while you were away. If a student misses a class and still has questions about lecture material, it is the student’s responsibility to contact the professor.

Etiquette: All class participants are expected to act professionally at all times. At a minimum, this shall include:

- Show up to class on time. Leave when the instructor has dismissed the class.
- Refrain from using cell phones or doing any activities irrelevant/disruptive during class periods.
- Actively participate in class activities.
- Treat all members of the class with respect.
- Complete assignments on time.
- Be a good team member.

University Policies

Students with Disabilities:

Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in the Henry Madden Library, Room 1202 (278-2811).

Honor Code:

“Members of the CSU Fresno academic community adhere to principles of academic integrity and mutual respect while engaged in university work and related activities.” You should:

- a) understand or seek clarification about expectations for academic integrity in this course (including no cheating, plagiarism and inappropriate collaboration)
- b) neither give nor receive unauthorized aid on examinations or other course work that is used by the instructor as the basis of grading.
- c) take responsibility to monitor academic dishonesty in any form and to report it to the instructor or other appropriate official for action.

Instructors may require students to sign a statement at the end of all exams and assignments that “I have done my own work and have neither given nor received unauthorized assistance on this work.” If you are going to use this statement, include it here.

Cheating and Plagiarism:

"Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work." Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University's policy regarding cheating and plagiarism, refer to the Class Schedule (Legal Notices on Cheating and Plagiarism) or the University Catalog (Policies and Regulations).

Computers:

"At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. Every student is required to have his/her own computer or have other personal access to a workstation (including a modem and a printer) with all the recommended software. The minimum and recommended standards for the workstations and software, which may vary by academic major, are updated periodically and are available from [Information Technology Services](http://www.csufresno.edu/ITS/) (<http://www.csufresno.edu/ITS/>) or the University Bookstore. In the curriculum and class assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources."

Disruptive Classroom Behavior:

"The classroom is a special environment in which students and faculty come together to promote learning and growth. It is essential to this learning environment that respect for the rights of others seeking to learn, respect for the professionalism of the instructor, and the general goals of academic freedom are maintained. ... Differences of viewpoint or concerns should be expressed in terms which are supportive of the learning process, creating an environment in which students and faculty may learn to reason with clarity and compassion, to share of themselves without losing their identities, and to develop and understanding of the community in which they live . . . Student conduct which disrupts the learning process shall not be tolerated and may lead to disciplinary action and/or removal from class."

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1	Introduction	
2	Basic Concepts of Strategic Management	Quiz 1 - Chapter 1
3	Corporate Governance and Social Responsibility	Quiz 2 - Chapter 2
4	Environmental Scanning and Industry Analysis	Quiz 3 - Chapter 3, Case Study 1
5	Internal Scanning: Organizational Analysis	Quiz 4 - Chapter 4, Case Study 2
6	Situation Analysis and Business Strategy	Quiz 5 - Chapter 5, Case Study 3 Corporate Strategy Planning Analysis, Part I
7	Corporate Strategy	Quiz 6 - Chapter 6 Case Study 4
8	Functional Strategy and Strategic Choice	Quiz 7 - Chapter 7 Case Study 5
9	Organizing for Action	Quiz 8 - Chapter 8 Case Study 6
10	Staffing and Leading	Quiz 9 - Chapter 9 Case Study 7
11	Evaluation and Control	Quiz 10 - Chapter 10 Case Study 8
12	Case Analysis Methods 1	
13	Case Analysis Methods 2	Corporate Strategy Planning Analysis, Part II
14	Position Paper/Case Study Presentations	Position Paper/Case Study
15	Position Paper/Case Study Presentations	Position Paper/Case Study