KENT STATE UNIVERSITY
CERTIFICATION OF CURRICULUM PROPOSAL

Preparation Date **28-Aug-19** Curriculum Bulletin _____

Effective Date **Fall 2020** Approved by EPC _____

Department

College **AE - Architecture and Environmental Design**

Degree **MS - Master of Science**

Program Name **Construction Management** Program Banner Code **COMA**

Concentration(s) Concentration(s) Banner Code(s)

Proposal **Establish program**

Description of proposal:

Establishment of an M.S. degree in Construction Management

Does proposed revision change program's total credit hours? ☐ Yes ☐ No

Current total credit hours: Proposed total credit hours **35**

Describe impact on other programs, policies or procedures (e.g., duplication issues; enrollment and staffing considerations; need; audience; prerequisites; teacher education licensure):

Program is currently offered as a specialization in the Master of Technology degree in the College of Aeronautics and Engineering. With this proposal, specialization will be elevated to a separate degree program, under the Master of Science degree, and moved into the College of Architecture and Environmental Design, which also administers the B.S. degree in Construction Management.

Units consulted (other departments, programs or campuses affected by this proposal):

College of Aeronautics and Engineering

REQUIRED ENDORSEMENTS

_____ ____/____/____

Department Chair / School Director

_____ ____/____/____

Campus Dean (for Regional Campuses proposals)

_____ ____/____/____

College Dean (or designee)

_____ ____/____/____

Dean of Graduate Studies (for graduate proposals)

_____ ____/____/____

Provost (or designee)

Construction Management Master of Science Degree

FULL PROPOSAL

Submitted to: Chancellor's Council on Graduate Studies
Ohio Department of Higher Education

Submit date: *to come*

Submitted by: College of Architecture and Environmental Design
Kent State University

KENT STATE UNIVERSITY

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Basic Characteristics of the Proposed Program

1. **Brief description of the disciplinary purpose and significance of the proposed degree.**

   Construction management is a service-based technical field that requires practitioners to address matters of time, cost, labor, safety and materials regarding the construction of the built environment, whether that be buildings, civil or landscape projects. Those that pursue a graduate program in construction management wish to prepare for leadership roles within organizations.

   The proposed M.S. degree in Construction Management will be housed in in the College of Architecture and Environmental Design, where students will have unique opportunities for and exposure to cross-collaborative learning experiences between architects and designers. The construction industry values graduate who can reach across disciplinary lines to achieve project success – something that is increasingly important at the pre-construction phase that demands increased cross-sector integration. The program will provide those opportunities through the curriculum, job site visits, team collaborations, networking events and professional association student chapters.

   Special Note: For the past five years, Kent State University has offered a construction management specialization within the Master of Technology (M.Tech.) degree in the College of Aeronautics and Engineering. Historically, the B.S. degree in Construction Management was also housed in the College of Aeronautics and Engineering. In 2017, the undergraduate degree program, courses and faculty were moved to the College of Architecture and Environmental Design. With the proposal, the specialization is being elevated to a separate degree program, within the Master of Science degree, and moved under the administration of the College of Architecture and Environmental Design.

2. **Definition of the focus of the program.**

   The overall mission of the proposed M.S. degree in Construction Management is to prepare professionals to lead construction organizations and complex projects in a rapidly changing world. Historically, construction companies have followed traditions and have been resistant to change over an extended period. It takes flexibility and applying knowledge gained from other fields to change the way buildings are built and managed. Since change in methods and management are typically tied to contracts, best practices in the industry are often owner-driven, risk-averse and lacking prototypes. Nevertheless, clients and firms alike are trying to integrate technology, implement contemporary cost-saving business practices and sustainable building methods and materials across the industry. Clients are driving change through technology, efficiency in practice and communication in the field. As an example of meeting client needs, construction companies are now hiring drone pilots to help track progress, estimate and conduct site management.

Kent State's M.S. degree in Construction Management will prepare students to understand how these changes affect the industry and how they can manage and train to enact the changes that clients and society are exerting on the construction industry. The program will address these transformational approaches throughout the curriculum. Through technology workshops (e.g., BIM, Revit, AutoCad, Bluebeam, Procore) and exposure to industry speakers, students will be consistently exposed to cutting edge developments in the industry and how to account for and promote innovation. The goal of the M.S. degree in Construction Management is to provide students the tools to solve the most complex built environment issues and develop the skills to manage and lead cross-disciplinary teams and organizations into the future.

3. Rationale for the degree name.

The Master of Science degree is appropriate for Kent State's proposed program, rather than a professional degree title, since students have the option to pursue original research through the culminating requirement, either a project or a thesis. All graduate programs accredited by the American Council on Construction Education (ACCE) are under the Master of Science degree, except for one.[1] All have a thesis option. The Master of Technology degree lacks any reference to construction management and is a lesser known degree designation in the construction industry.

4. Duration of the program.

a. Total credit hours for completion of the program:

The degree program will be 35 semester credit hours.

b. Normal or typical length of time for students to complete the program:

Length of the program will be one-and-a-half to two years for a full-time student.

5. Proposed initial date for implementation of the program.

The proposed implementation of the M.S. degree in Construction Management is fall 2020.

6. Admission requirements and admission timing.

The program will admit students in fall and spring semesters. Applicants must hold a bachelor's degree, minimum 3.000 undergraduate GPA (on a 4.000 point scale) and submit two letters of recommendation.

7. Primary target audience for the program.

The intended audience for the proposed Construction Management degree program come from three populations: recent graduates with a bachelor's degree in construction management, early or mid-career industry professionals and those intending to advance to a

[1] Clemson University's accredited program is under the Master of Construction Science and Management degree.

doctorate. The flexibility of a thesis or project option will allow these differing groups to choose the path that best suits their goals.

The first audience is recent graduates in construction management or a related program who wish to advance their education and management skills. Kent State has offered a B.S. degree in Construction Management since 2013, with 163 graduates to date. In fall 2019, 259 students were enrolled in the major (15th day census). With this program as a source, as well as bachelor's programs from other colleges and universities, there will be large pool of potential students for this program.

The second audience is construction industry professionals who are looking to expand their knowledge base and advance their careers and potential growth trajectory. The third audience is those who seek to work in academe, to teach or who want to pursue an advanced or terminal degree, such as a doctorate in the discipline with a focus on research.

8. Special efforts to enroll and retain underrepresented groups.

a. Plan to ensure recruitment, retention and graduation of groups underrepresented within the discipline.

The College of Architecture and Environmental Design has plans develop recruiting programs for underrepresented students in Medina, Portage, Stark, Summit and Wayne Counties. One example is a bridge summer program with secondary schools and community colleges to promote graduate education to prospective students of diverse backgrounds, specifically Black, Hispanic and Native American. The goal of such a program will be to allow participating students to meet faculty members and students in the program, be introduced to the area and local attractions while ultimately qualifying for funding that contributes to their education at Kent State University

To increase enrollment from underserved populations, the college is focusing on recruitment into undergraduate programs, with the aim to use them as feeder programs into the master's degree. In addition to developing articulation agreements with area community colleges and being involved in the Kent State's Pre-College/TRIO Upward Bound programs, the college participates in the Architecture, Construction and Engineering (ACE) Mentor Program, whose mission is to engage, excite and enlighten high school students to pursue careers in architecture, engineering and construction and to support their continued advancement in the industry. Last year, the ACE Mentor Program Cleveland awarded 30 scholarships, totaling $125,000, to graduating seniors across Northeast Ohio. Kent State matched the scholarships (maximum $1,500 a year), for students admitted to programs in architecture, interior design and construction management.

The full-time faculty of the construction management program at Kent State is currently 40 percent black and 20 percent female, well beyond the standard distribution in the U.S. construction industry. Furthermore, in an industry with exceedingly low female student participation (6.85 percent nationally per the National Center for Education Statistics over the five major degree issuing institutions), Kent State's undergraduate program is 12 to 15 percent female students, who disproportionately serve in student leadership

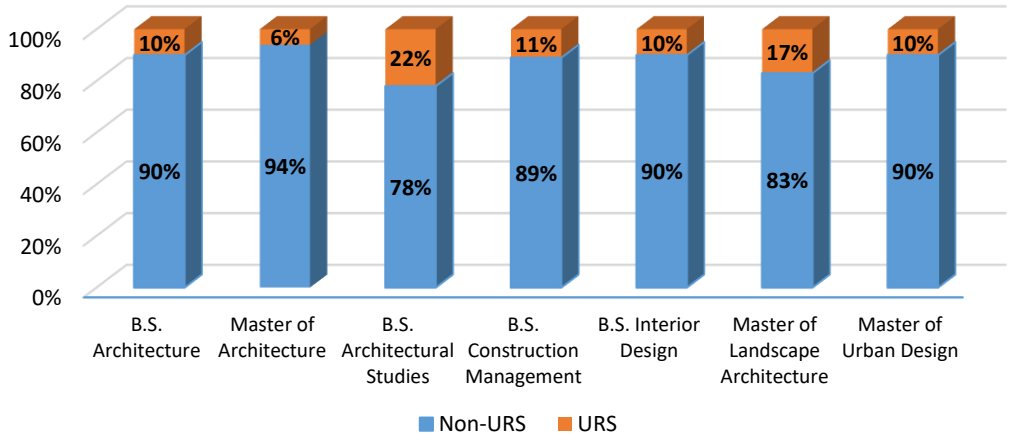
roles. Data provided by the Integrated Postsecondary Education Data System (IPEDS)[2] identified students who earned a degree in construction management included 88.2 male, 72.5 percent white, 6.5 percent black or African American, 6 percent Hispanic, 1.4 percent Asian and 1 percent American Indian/Alaska Native.

The College of Architecture and Environmental Design will continue to emphasize this climate in its faculty and student recruitment efforts to assure underrepresented students are included. In addition to the activities listed above, the college plans coordinated efforts with Kent State's Division of Diversity, Equity and Inclusion to advertise the program in minority-oriented media and to advertise the program to students at historically black colleges and universities with construction-related degrees programs and to professional settings with large populations of underrepresented groups.

b. **Provide as background a general assessment of the following: (1) institution and departmental profiles of total enrollment and graduate student enrollment of underrepresented groups within the discipline; and (2) comparison with nationally reported values from National Center for Educational Statistics, Council of Graduate Schools or other authoritative sources. Supply data by demographic group where available.**

Kent State's B.S. degree in Construction Management has an 11-percent enrollment by underrepresented students (see figure 1), which is on par with the national average of 10 percent (source: IPEDS).

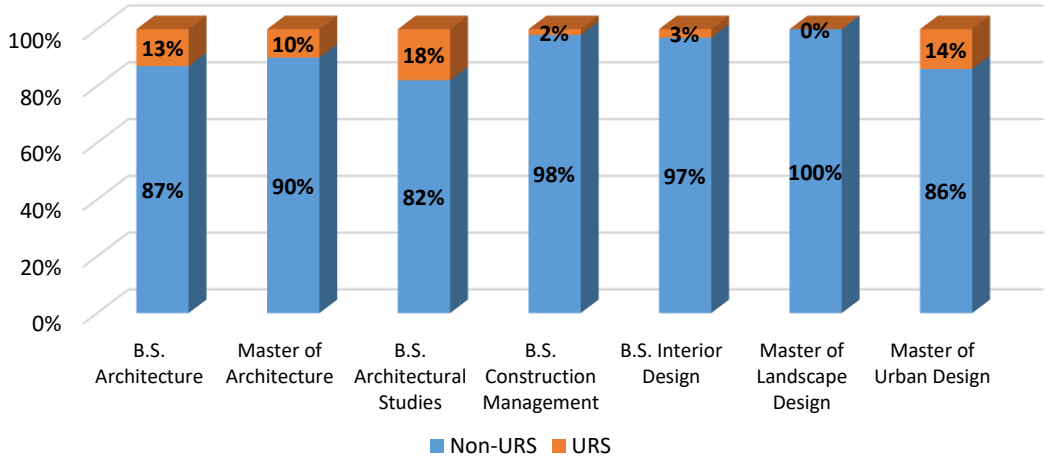
Figure 1: Enrolled underrepresented (URS) students, by major, in the College of Architecture and Environmental Design (Fall 2019 Semester)



Graduation numbers for underrepresented students in the construction management bachelor's degree was lower in fiscal year 2019 (see figure 2). Data on nationwide demographics could not be found for master's degree programs in this field.

[2] Integrated Postsecondary Education Data System Completions (2016). Construction management: race and ethnicity by degrees awarded. Retrieved from https://datausa.io/profile/cip/construction-management.

Figure 2: Graduated underrepresented (URS) students, by major, in the College of Architecture and Environmental Design (Fiscal Year 2019)



Institutional Planning for Program Change

1. **What are the physical facilities, equipment and staff needed to support the program?**

   Current facilities, equipment and staff are in place for the existing bachelor's degree and will be sufficient for implementation of the proposed degree program. In 2016, the college moved into a new 117,000-square-foot, LEED Platinum-certified building on the Kent Campus. The building contains a cascading studio loft that promotes interdisciplinary engagement and peer-to-peer learning. The building includes the following instructional facilities and equipment for students.

   - Two computer labs with the required software to succeed in the industry. Including Bluebeam Revu, P6 Scheduling, Revit and Rhino.
   - Dedicated construction management laboratory for testing, building and storing equipment
   - Fabrication laboratory with wood tools, metal shops, CNC milling machines and robotic arms
   - Wind tunnel
   - Slump testing, research and meeting spaces
   - Lighting laboratory
   - College library
   - Materials library for testing and housing various construction materials for research
   - Computing and surveying equipment for faculty and students
   - Two fully functional drones for testing, site layout and photogrammetry

2. What is the evidence that a market for the new program exists?

a. How has estimated program demand been factored into realistic enrollment projections?

Estimated program demand is based on the enrollment and graduation numbers of students who selected the M.Tech. construction management specialization. Between 2014 and 2019, 50 students, total, enrolled, of which 35 students have now graduated and nine are still enrolled.

b. How has this evidence been used in planning and budgeting processes to develop a quality program that can be sustained?

The college has used the five years of student enrollment and faculty capacity to teach courses in the M.Tech. construction management specialization to plan and budget for the proposed new degree program. Per the fiscal impact statement (see appendix A), the program will operate with a net gain at implementation.

c. Provide evidence of need for the new degree program, including the opportunities for employment of graduates. Examples of potential metrics of program need include: (1) Student interest and demand: potential enrollment; ability to sustain the critical mass of students; (2) institutional need: plan for overall development of graduate programs at the university; and (3) societal demand: intellectual development; advancement of the discipline; employment opportunities to meet regional, national needs and/or international needs.

The majority of the students enrolled in the M.Tech. construction management specialization are employed with firms that offer tuition reimbursement to encourage employees to continue their education. For example, the Turner Construction Company (with 45 office nationwide, including four in Ohio) provides a $40,000 tuition reimbursement program. In addition, both Turner Construction and companies such as Hensel Phelps support students that are currently enrolled in construction management programs once the students have signed a full-time job offer. Gilbane Building Company (with more than 45 offices globally, including two in Ohio) is another example of a firm that offers tuition reimbursement as a benefit.

Calls to elevate the program to its own degree entity have come from the college's industry advisory board, past and current students for several years, see appendix B for letter of support and appendix C for results of student survey. The college's undergraduate and graduate students in construction management have had a 100-percent job placement rate over the past six years at such companies as RWJ Wiring Inc., Vocon Partners, Metis Construction Services, Gilbane Building Company and Turner Construction Company.

The proposed M.S. degree will expand the college's potential to provide new knowledge through research for the industry. A research component of the program will offer industry partners a way to fund and initiate research projects that address their needs in the field and will contribute to the integration of new technologies and techniques as well as global concerns related to the discipline.

Geographically, the need for students in the field to pursue a master's degree is growing in sync with the growth in regional industrial areas (e.g., Pittsburgh, Columbus, Akron, Cleveland) that are building at an increasing rate. The complexity of new technologies and techniques employed in construction have led industry leaders increasingly to focus on advanced degree graduates.

The American Society of Civil Engineers' grades the country's infrastructure at a D+.[3] College faculty tracking employment have found that local industry partners are hiring recent graduates at an increasing rate to meet the demand of building and infrastructure projects. Third-world countries are expanding their construction needs as their populations grow. The College of Architecture and Environmental Design has the potential to provide graduates prepared to lead in existing and new markets that are in dire need of educated, driven and well-rounded professionals.

Statewide Alternatives

1. What programs are available at other institutions, and how do they differ from the program being proposed?

Four universities in Ohio offer a similar or related program at the graduate level:

University	Graduate Degree Program
Bowling Green University	Master of Technology Management degree, Technology Management (Construction Management)
Ohio State University	M.S. degree, Civil Engineering (Construction Engineering and Management)
Ohio University	M.S. degree, Civil Engineering (Construction Engineering and Management)
University of Cincinnati	M.S. degree, Civil Engineering (Construction Engineering and Management)

Bowling Green University's program is one of three concentrations within the Technology Management major and has a technology curriculum core for all concentrations, unlike Kent State's proposed program, which will be its own degree program with a curriculum focused solely on construction management. Similarly, with the programs at the other universities, construction management is one of several concentrations within the Civil Engineering major, and not its own dedicated degree program. While civil engineering, construction engineering and construction management are related fields, they offer different employment opportunities.

In the country, there are only four master's degree programs in construction management accredited by the American Council for Construction Education. These programs are located in the states of Georgia, Louisiana, Massachusetts and South Carolina.[4]

[3] American Society of Civil Engineers (2017). Infrastructure Report Card. Retrieved from www.infrastructurereportcard.org.

[4] American Council for Construction Education. Accredited master programs. Retrieved from www.acce-hq.org/accredited_programs/category/masters-programs.

2. **Explain the appropriateness of the specific locale for the program.**

   Kent State University's location offers a unique geographical advantage for the master's program. The campus is within 50 miles of the cities of Cleveland, Akron and Youngstown, and approximately 100-135 miles of Pittsburgh and Columbus, which enables the university to offer this program with industry support and demand in these areas. No other university in Northeast Ohio offers a master's degree in construction management.

3. **Are there opportunities for inter-institutional collaboration to offer the program?**

   Kent State does not foresee any collaborations with other universities at this time. However, the degree program's focus on leadership, operations and management will offer the opportunity for intra-institutional collaborations on course offerings and research between the College of Architecture and Environmental Design and other Kent State colleges, such as the College of Business Administration and the College of Aerospace and Engineering.

Growth of the Program

1. **What future growth do you anticipate over several years?**

   The college anticipates that once the proposed M.S. degree in Construction Management is implemented, enrollment growth will expand at a rate of five to eight percent each academic year. Per the fiscal impact statement (see appendix A), the expectation is 20 enrolled students by year four of the program.

2. **How do you plan to manage this growth?**

   As the courses are existing and offered by existing faculty, current resources are sufficient for the initial year, with the expectation that if the program grows more than predicted, the college dean will evaluate additional full-time hires. The current facilities and staff serve existing students, with room to accommodate more.

3. **When do you expect the program to be self-sufficient?**

   The college contends the program is already self-sufficient, having been offered as a specialization for the past five years in the Master of Technology degree.

Curriculum and Instructional Design

1. **Description of the proposed curriculum, including any concentrations, cognates or specializations within the major**

   The proposed M.S. degree in Construction Management is 35 credit hours, comprising the following components:

	Credit Hours
Research	9
Required coursework	9
Elective coursework	9-14
Culminating requirement	3-8

Throughout the curriculum (see table below), students will be exposed to real-world projects, project teams and interdisciplinary project delivery methods in collaboration with local industry. Students will undertake site visits, interact with local companies and complete multiple interrelated research projects.

For the culminating requirement, students select either the thesis or project. Students selecting the thesis will explore an issue related to the practice of construction management, relying on research methods and drawing from their exposure to the discipline. For the project, students will work in teams to develop a comprehensive plan to build a tangible project for a company. That project involves creating a safety plan, managing risk, estimating, scheduling and marketing. The students will then present the plan to a committee of faculty and industry executives.

All construction management courses in the proposed curriculum are existing and have been offered for the M.Tech. specialization, with the exception of a new risk management course and the master's project (noted below as new).

Table 1: Curriculum for the proposed M.S. degree in Construction Management

Research Requirements (9 credit hours)		
AED 60922	Methods of Inquiry in Architectural Studies	2
AED 60923	Empirical Research in Environmental Design	1
AED 60930	Applied Research Methods in Architecture and Environmental Design	3
CMGT 62080	Advanced Construction Risk Management **NEW**	3
Construction Management Requirements (18 credit hours)		
CMGT 52105	Construction Contracts and Law	3
CMGT 52107	Construction Scheduling	3
CMGT 52110	Advanced Construction Management	3
Major Electives, choose from the following:		9
CMGT 51041	Advanced Estimating (3)	
CMGT 62030	Building Information Modeling for Construction Management (3)	
CMGT 62040	Construction Methods Improvements (3)	
CMGT 62050	International Construction Management (3)	
CMGT 62060	Negotiation in the Built Environment (3)	
CMGT 62070	Engineering Economics and Strategic Decision Making (3)	
CMGT 67320	Applied Sustainability in Construction Management (3)	
Culminating Requirement (8 credit hours)		
Choose from the following:		8
Thesis		
AED 66099	Thesis Preparation Seminar (2)	
AED 66199	Thesis I (6)	
Master's Project		
CMGT 65099	Master's Project in Construction Management (3)[1] **NEW**	
Graduate Electives (5 hours)		
	Minimum Total Credit Hours:	**35**

Catalog copy is in appendix D. Course descriptions are in Appendix E.

Institutional Staffing, Faculty and Student Support

1. **How many and what types of faculty (full and part time) will be employed in the program? Describe how number and type of faculty is sufficient to support the program (especially if the program contains a research or heavily mentored activity).**

Three full-time faculty members (two tenure track and one non-tenure track) have been teaching graduate-level construction management courses for the past two years for students who have chosen that specialization in the Master of Technology degree. Those three will continue with the program, in addition to one full-time, non-tenure track faculty member who joined the program in fall 2019 (see table below). The four faculty members also teach courses for the B.S. degree.

The research courses (AED) are required in the M.S. degree in Architecture and Environmental Design. Three full-time, tenured faculty from that program will teach those courses for both programs.

Based on past student enrollment in the M.Tech. specialization, the college projects the current faculty capacity is adequate to meet the needs of the program for the first two years of implementation. Faculty CV are in appendix F.

Construction Management Faculty		
Faculty Member	**Terminal Degree**	**Courses Taught and/or Proposed**
Simon Adamtey Assistant Professor (TT)	Ph.D. Technology Management Indiana State University, 2016 *	CMGT 51041 Advanced Estimating CMGT 62030 Building Information Modeling for Construction Management CMGT 62080 Advanced Construction Risk Management
Sara Brandner Lecturer (NTT)	Master of Technology, Kent State University, 2018	CMGT 62040 Construction Methods Improvements
Suat Gunhan Program Director and Professor (tenured) *joins Kent State in spring 2020*	Ph.D., Civil Engineering, Illinois Institute of Technology, 2003	CMGT 62060 Negotiation in the Built Environment CMGT 67320 Applied Sustainability in Construction Management
Anthony Mirando Lecturer (NTT)	M.S., Management, Colorado State University, 2014 In progress: Ph.D., Geography, Kent State University LEED AP-ND (Accredited Professional-Neighborhood Development), OSHA 30-hour Construction Industry Outreach Training Procore Certified (6)	CMGT 51041 Advanced Estimating CMGT 52107 Construction Scheduling CMGT 52110 Advanced Construction Management CMGT 62050 International Construction Management

Construction Management Faculty		
Faculty Member	**Terminal Degree**	**Courses Taught and/or Proposed**
Lameck Onsarigo Assistant Professor (TT)	Ph.D., Technology Management Indiana State University, 2016	CMGT 52105 Construction Contracts and Law CMGT 62070 Engineering Economics and Strategic Decision Making CMGT 65099 Master's Project in Construction Management
Architecture Faculty		
Faculty Member	**Terminal Degree**	**Courses Taught and/or Proposed**
Reid Coffman Associate Professor (tenured)	Ph.D., Urban Ecology and Environmental Horticulture, Ohio State University, 2007 *	AED 60923 Empirical Research in Environmental Design AED 66099 Thesis Preparation Seminar
Elwin Robison Professor (tenured)	Ph.D., Architectural History, Cornell University, 1985 PE - Professional Engineer	AED 60922 Methods of Inquiry in Architectural Studies AED 60923 Empirical Research in Environmental Design
Adil Sharag-Eldin Associate Professor (tenured)	Ph.D., Architecture, University of California-Berkeley, 1998 LEED AP (Accredited Professional)	AED 60922 Methods of Inquiry in Architectural Studies AED 60923 Empirical Research in Environmental Design AED 60930 Applied Research Methods in Architecture and Environmental Design AED 66099 Thesis Preparation Seminar

** Credential not on file with the Kent State University Office of Academic Personnel.*

2. How many, if any, new faculty will be hired for the program?

The college hired a new program director for the construction management program at the rank of professor with tenure. He starts in January 2020.

3. What are the administrative arrangements for the proposed program, including oversight at the program, department/school and college level?

The College of Architecture and Environmental Design operates on a lean, shared support staff model without departments, which is a strategic decision to enhance engagement between related disciplines that are increasingly and necessarily integrated.

A tenured faculty member will serve as program director for both the existing B.S. degree and proposed M.S. degree in Construction Management. The program director reports to the college dean.

4. **Where will any needed financial support and staffing come from?**

   The majority of the faculty and courses for the proposed degree program are existing and support both the undergraduate and graduate programs.

Academic Quality Assessment

1. **How is the program distinctly different, both conceptually and qualitatively, from the undergraduate degree programs in the same or related disciplines? If applicable, provide a detailed listing of the specific differences.**

   The M.S. degree differs from the B.S. degree in Construction Management in that it exposes students to higher levels of organization thinking and decision making. At the undergraduate level, students learn to estimate simple tasks (e.g., drywall, painting, mechanical, electrical and plumbing). At the graduate level, students focus on advanced understanding of organizations, technologies, decision-making, economic factors and risk mitigation in running a construction company or construction project. As an example, students in the bachelor's degree learn to calculate the cost of leasing a piece of equipment for an individual project. Students in the master's degree will learn how to make decisions on either purchasing or leasing a million-dollar piece of equipment, considering the effect on a company's payroll, cashflow and liquid assets, as well as the alignment of the decision with the company's overall goals and mission.

2. **How does the program emphasize the theoretical basis of the discipline as expressed in the methods of inquiry and ways of knowing in the discipline?**

   The program will follow industry practice procedures in risk analysis, estimating, scheduling, and more. In the construction management field, there are fairly set standards. Students will be expected to learn how to make critical decisions while evaluating project delivery methods, pre-construction and cross-collaboration. Kent State's proposed degree program will emphasize decision theory in project management through the required course CMGT 62080 Advanced Construction Risk Management, although every course in the curriculum applies these decision makings principles. While much of construction management is practiced based, decision theory is crucial in educating leaders in the industry.

3. **How does the program place emphasis on professional decision making and teach the use of critical analysis in problem solving?**

   The program has project-based learning embedded into the curriculum. Students are exposed to tangible projects, that (in some instances) they work with teams to deliver project solutions. Faculty use their experiences and professional backgrounds to present scenarios for students to apply what they have learned in presenting solutions.

4. **How is the program designed to educate students broadly, so they are able to understand the major issues and concerns in the discipline or professional area?**

   The college's goal with the program is to expose students to major issues in construction, and construction management through project-based learning and real-world exposure to the construction industry – these goals will be delivered through assignments, guest lectures

and field trips to jobsites. The issues students explore will vary from project level to organizational level.

5. **What are the faculty resources appropriate for the research component of the program?**

   The College of Architecture and Environmental Design has sufficient full-time faculty to assist students wishing to pursue the thesis option. Teaching assistants, graduate assistants and research assistance can be allocated with the permission of the administration. This option, together with research assistantships, will help faculty perform meaningful research while guiding students who are undertaking comprehensive research. When appropriate, faculty will be granted course load reductions to accommodate high advising loads.

6. **How does the program's curriculum offer what students need to know for competence at the expected level of professional expertise?**

   Faculty have developed the program's curriculum to address input from the college's industry board and to meet the accreditation standards for graduate programs set by the American Council for Construction Education (ACCE). The proposed curriculum is consistent with those standards, and it is also distinctive. The program will cover topics that are integral to leading and managing construction projects and focus on the context of working with industry-related partners (e.g., architects). Faculty who developed the courses have been practitioners in the field and are aware of best practices both in the field and in higher education.

   In addition, the college routinely surveys employers on the competencies of the Kent State B.S. graduates they hire. Currently, the college's B.S. graduates are meeting employer expectations with a 98 percent positive rating. The college will continue to use employer surveys to ensure the construction management curriculum at both degree levels is relevant and impactful to address the needs of the industry.

7. **What plans have been made to address standards and guidelines for professional accreditation, if applicable?**

   Kent State's B.S. degree in Construction Management is in candidate status (2018-2023) with the American Council for Construction Education (ACCE), and the college plans to pursue the same accreditation for the master's degree. Kent State faculty designed the master's program following the ACCE standards, including curriculum, learning outcomes, assessment, faculty and industry advisory requirements.[5]

[5] American Council for Construction Education (July 27, 2018). Standards and criteria for accreditation of master's degree construction management programs. Retrieved from www.acce-hq.org/images/uploads/Doc_103M_Final_Updated_072718.pdf.

Appendix A: Fiscal Impact Statement

	Year 1	Year 2	Year 3	Year 4
I. Projected Enrollment				
Headcount full-time	7	9	11	13
Headcount part-time	2	4	6	7
Full-time equivalent (FTE) enrollment	2	3	3	4
II. Projected Program Income				
Tuition	$62,208	$85,536	$108,864	$128,304
Expected state subsidy	$51,582	$70,926	$90,269	$106,388
Externally funded stipends, as applicable	$-	$-	$-	$-
Other Income	$3,200	$4,400	$5,600	$6,600
Total Projected Program Income	**$116,990**	**$160,862**	**$204,733**	**$241,292**
III. Program Expenses				
New personnel:				
Instruction				
Full-time:				
Part-time:				
Non-instruction				
Full-time:	$-	$-		
Part-time:	$-	$-	$-	$-
Current personnel:				
Instruction				
Full-time:5	$24,967	$25,466	$25,976	$26,495
Part-time: 17	$12,000	$12,000	$12,000	$12,000
Non-instruction				
Full-time:				
Part-time: 1 staff				
Benefits for all personnel	$10,351	$10,491	$10,633	$10,779
New facilities/building/space renovation	$-	$-	$-	$-
Scholarship/stipend support	$-	$-	$5,000	$5,000
Additional library resources	$-	$-	$-	$-
Additional technology or equipment needs	$-	$1,500	$2,500	$3,500
Other expenses (see below)	$45,516	$80,431	$102,366	$120,646
Total Projected Program Expenses	**$92,834**	**$129,888**	**$158,475**	**$178,420**
Projected Program Net	**$24,156**	**$30,974**	**$46,257**	**$62,872**
Other Expenses				
Allocation of expenses covered by general fee	$-	$-	$-	$-
RCM overhead - estimated at 50%	$45,516	$80,431	$102,366	$120,646
RCM tuition allocation to other colleges	$-	$-	$-	$-
Professional development	$-	$-	$-	$-
Supplies (office, computer software, printing)	$-	$-	$-	$-
Telephone, network, and lines	$-	$-	$-	$-
Other info and communication pool	$-	$-	$-	$-
Total Other Expenses	**$45,516**	**$80,431**	**$102,366**	**$120,646**

BUDGET NARRATIVE:

We currently have, and tech at the CAED-with it's robust existing facilities-this will be a seamless transition (supplied by GCMG Committee).

Appendix B: Letter of Support

JCI CONTRACTORS

August 20, 2019

Kent State University
Construction Management
132 S. Lincoln
Kent, Ohio 44242

To whom it may concern:

I am writing this letter to recommend a Master of Science program in Construction Management at Kent State University. As both an executive in the construction industry and member of the industry advisory board for Kent's construction management program, I am in full support of such a master's degree.

As our industry continues to evolve and change at a rapid pace, we need to prepare students at the highest level. They need to be equipped with the knowledge and leadership skills to direct and manage today's construction companies. A construction management master's degree would allow students to gain practical training to navigate the complexities of contracts, project management, and general business management functions.

I am excited for the future of our industry and the young professionals who are going to lead it.

If you have any questions, please feel free to contact me via email at charlieb@jcibuilds.com or on my personal cell phone – 440-812-8698.

Thank you,

Charles N. Borsukoff, MBA, LEED GA
Executive Vice President
JCI Contractors, Inc.

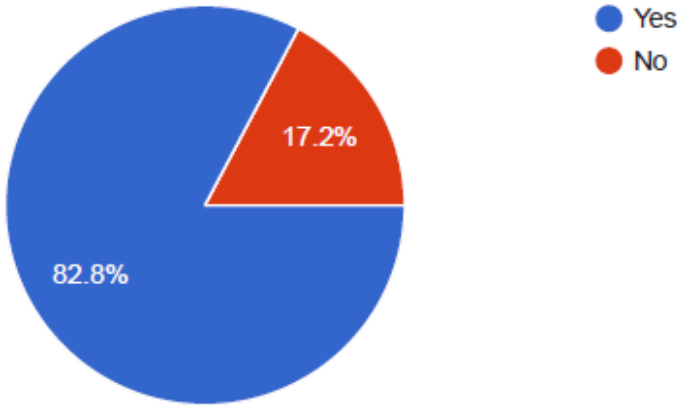
529 W. Prospect Rd. – Ashtabula, Ohio – 44004
Phone 440-998-0609 Fax 440-998-1485 www.jcibuilds.com

Appendix C: Results of Student Survey

Master of Science in Construction Management

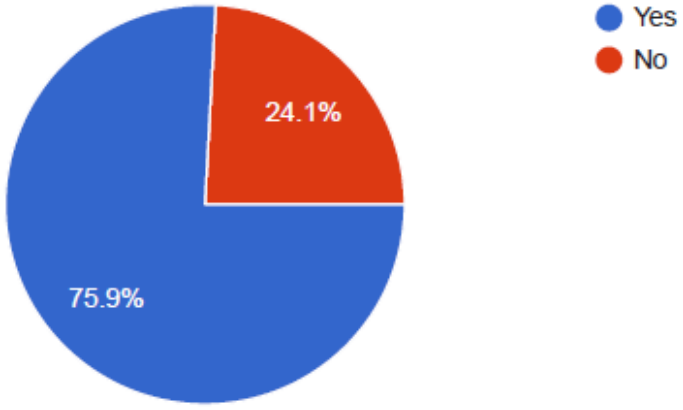
Would you consider pursuing a master's degree?

29 responses



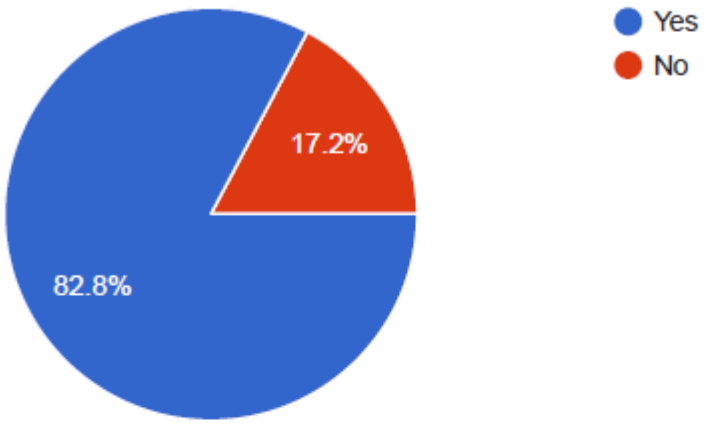
If so, would you consider a Masters of Science in Construction Management

29 responses



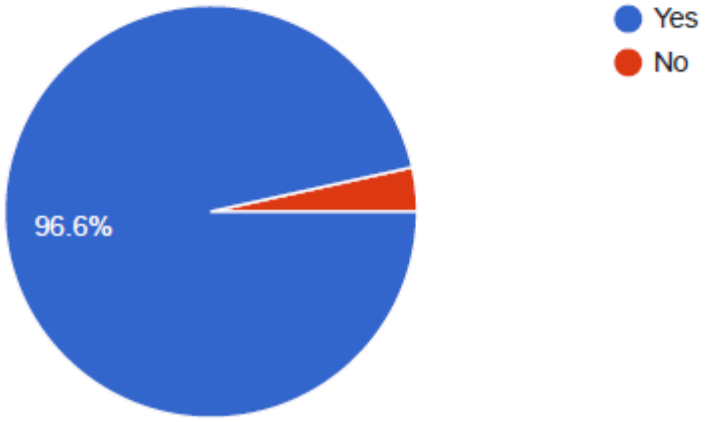
Would you pursue the MSCM at Kent State University?

29 responses



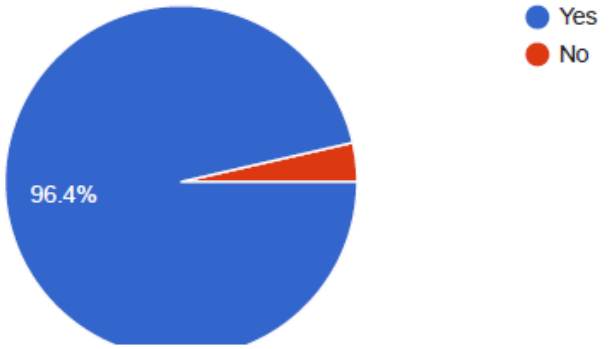
Do you view a graduate degree as adding value to you as a professional?

29 responses



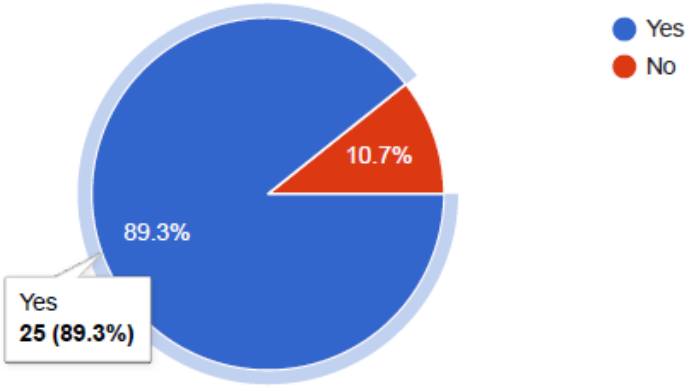
Do you believe Kent State should create a MSCM ?

28 responses



Do you feel that your employer would see value in graduate education?

28 responses



Appendix D: Program Catalog Page

Description

The Master of Science degree in Construction Management offers students a deep understanding of leading dynamic construction projects and organizations in the built environment. The program also offers a thesis and non-thesis option for those interested in a research and/or a future higher education role. Graduates of the program are prepared to lead at both the project and corporate level.

Fully Offered At:

- Kent Campus

Admission Requirements

- Bachelor's degree from an accredited college or university for unconditional admission
- Minimum 3.000 undergraduate GPA (on a 4.000 point scale) for unconditional admission
- Official transcript(s)
- Two letters of recommendation
- English language proficiency - all international students must provide proof of English language proficiency (unless they meet specific exceptions) by earning one of the following:
    - Minimum 525 TOEFL PBT score (paper-based version)
    - Minimum 71 TOEFL IBT score (Internet-based version)
    - Minimum 74 MELAB score
    - Minimum 6.0 IELTS score
    - Minimum 50 PTE score

For more information about graduate admissions, please visit the Graduate Studies website. For more information on international admission, visit the Office of Global Education website.

Program Learning Outcomes

Graduates of this program will be able to:

1. Exhibit the planning, organization, execution and contract skills of a construction manager.
2. Apply ethical and sustainability perspectives to construction management knowledge.
3. Demonstrate the financial, managerial and risk management of a leader in the construction industry.
4. Analyze how issues of cost, safety, quality, schedule and design impact project development and implementation.
5. Evaluate the procurement and logistics processes of underlying construction systems and devise strategies to mitigate these complexities.
6. Compare construction management technologies, innovations and processes, and how they relate to cross-disciplinary teams.

Program Requirements

Major Requirements

AED 60922	Methods of Inquiry in Architectural Studies	2
AED 60923	Empirical Research in Environmental Design	1
AED 60930	Applied Research Methods in Architecture and Environmental Design	3
CMGT 52105	Construction Contracts and Law	3
CMGT 52107	Construction Scheduling	3
CMGT 52110	Advanced Construction Management	3
CMGT 62080	Advanced Construction Risk Management ***NEW COURSE***	3
Major Electives, choose from the following:		9
CMGT 51041	Advanced Estimating (3)	
CMGT 62030	Building Information Modeling for Construction Management (3)	
CMGT 62040	Construction Methods Improvements (3)	
CMGT 62050	International Construction Management (3)	
CMGT 62060	Negotiation in the Built Environment (3)	
CMGT 62070	Engineering Economics and Strategic Decision Making (3)	
CMGT 67320	Applied Sustainability in Construction Management (3)	
Culminating Experience: Thesis or Project, choose from the following		8
AED 66099	Thesis Preparation Seminar (2)	
& AED 66199	Thesis I (6)	
CMGT 65099	Master Project in Construction Management (3) ***NEW COURSE***	
& Graduate Electives (5)		

Minimum Total Credit Hours: 35

Appendix E: Course Descriptions

AED 60922 Methods of Inquiry in Architectural Studies (2 credit hours)
(Cross-listed with ARCH 60922 and LARC 60922) Provides a comprehensive coverage of architectural inquiry techniques, including qualitative and quantitative research methods and critical-thinking skills to help students better conduct and understand research.

AED 60923 Empirical Research in Environmental Design (1 credit hour)
(Cross-listed with LARC 60923) Introduces a student to faculty-directed research in a field with the environmental design domain. Typically, the course will include lectures by research faculty, readings from primary and review literature, and regular discussions among students, faculty and other research associates working under the direction of a principal investigator.

AED 60930 Applied Research Methods in Architecture and Environmental Design (3 credit hours)
Addresses ontological and epistemological underpinnings of applied research methods in the environmental design fields. It is intended to extend students' understanding of quantitative and qualitative research methods, data collection, analysis and interpretation.

AED 66099 Thesis Preparation Seminar (2 credit hours)
Designed for students writing a thesis in the Master of Science in Architecture and Environmental Design Program. Supports students development of research topics, review relevant research and scholarship, frame research questions and arguments, choose an appropriate methodology for analysis, and draft introductory and methodology sections of the thesis proposal document.

AED 66199 Thesis I (6 credit hours)
Thesis students must register for a total of 6 hours.

CMGT 51041 Advanced Estimating (3 credit hours)
(Slashed with CMGT 41041) Course covers putting costs to the project, finalizing the bid, incorporating the estimate into the schedule, buying out the project, bidding ethics and using computer spreadsheets, including Excel, to automate estimating functions.

CMGT 52105 Construction Contracts and Law (3 credit hours)
(Slashed with CMGT 42105) Course covers the fundamentals of construction contracts and law; the impact of information technology on contracts and contracting; and the effect of contracts and law on the management, administration and costs of construction work.

CMGT 52107 Construction Scheduling (3 credit hours)
(Slashed with CMGT 42107) The traditional theory of planning, scheduling and controlling construction projects. Current industry standard computer applications for scheduling are utilized.

CMGT 52110 Advanced Construction Management (3 credit hours)
A comprehensive application of construction management principles and practices to various situations and projects according to construction industry methods and performance standards.

CMGT 62080 Construction Risk Management (3 credit hours)
An in-depth study of various risks associated with construction projects, and how those risks affect the construction industry. Topics of discussion include analytical and management techniques used to identify, analyze and respond to construction risks. Students review case studies, texts and instructor examples of how to identify and mitigate risks.

CMGT 62030 Building Information Modeling for Construction Management (3 credit hours)
Course reinforces and investigate the usage of building information modeling (BIM) as a construction management tool. Students create BIM models, with scheduling and cost loading, to understand how BIM usage is maximized within the built environment. Student utilizes software applications to create the BIM model and integrate the construction schedule and estimate. Students also perform research on the application of BIM in the industry.

CMGT 62040 Construction Methods Improvements (3 credit hours)
A focused study of the philosophy and principles of quality management as applied to the construction industry. Course presents a project-based approach to the principles and practices of Total Quality Management (TQM) in construction projects and the application of TQM and other quality measures during different phases of the construction process.

CMGT 62050 International Construction Management (3 credit hours)
Topics include operating and sustaining an international business or business presence, the global market, project funding, case studies and best practices. Course includes project-specific case studies.

CMGT 62060 Negotiation in The Built Environment (3 credit hours)
Examination of negotiation theories, strategies and tactics as applied to transactions in the construction and technological environments. Establishment of win-win environment in dealing with the project parties by adopting creative means to solve problems and resolve disputes. Practice through negotiation case studies, scenarios and role playing.

CMGT 62070 Engineering Economics and Strategic Decision Making (3 credit hours)
Application of engineering economic principles related to evaluating alternative solutions, replacement decisions and retention decisions. Includes decision and risk analysis, sensitivity analysis, expected value, benefit cost analysis, public sector economics, economic cycle, operation research, strategic management and entrepreneurship in the technological environment.

CMGT 62080 Advanced Construction Risk Management (3 credit hours) **NEW COURSE**
This course provides an in-depth study of various risks associated with construction projects, and how those risks affect the construction industry. This course prepares leaders to make decisions that affect individual projects and the organization as a whole. Topics of discussion include analytical and management techniques used to identify, analyze, and respond to construction risks. Students review case studies, texts, and use instructor examples of how to identify and mitigate risks.

CMGT 65099 Master's Project in Construction Management (3 credit hours) **NEW COURSE**
Application of all previous construction management courses and experiences to ensure all major learning objectives have been obtained, and that these learning objectives can be applied to performance similar to industry best practices.

CMGT 67320 Applied Sustainability in Construction Management (3 credit hours)
Investigation of strategies and methods used by construction managers and others to assist in developing sustainable built environments. Course takes a close look at standards for environmentally sustainable construction and at the application of best management practices for construction activities. Focus is on LEED certification, international standards on environmental management systems and other established criteria, guidelines, standards and tools associated with green building. Provides an in-depth discussion and practical application of LEED assessment, guidelines and standards for various building sectors. Includes a major individual design project/case study involving research in green construction and design on a particular construction project, along with the application of LEED guidelines, assessment and methods to the project.

Appendix F: Faculty Curriculum Vitae

See separate attachment.