

New Graduate Degree Program Development Plan

Master of Science Construction Management

This document should be no more than five pages.

1. Designation of the new degree program, rationale for that designation, definition of the focus of the program and a brief description of its disciplinary purpose and significance.

The designation of the new program is Master of Science (M.S.) in Construction Management. The M.S. designation is what potential students that fit the profile of the program desire, will provide recognition among the potential students and employers as specific to the industry, and hence translate into a potentially higher enrollment of top quality applicants as well as professional acceptance in the job market. The M.S. will also allow for the creation of unique courses in our course portfolio, distinguish us from the current Master of Technology, with a track in construction management, in the region, and will provide an opportunity to compete with similar M.S. programs in the region.

The current Construction Management program consists of a Bachelor of Science in Construction Management, with a general track and three specific concentrations in Mechanical, Electrical and Plumbing, Civil and Safety. The program is housed in the College of Architecture and Environmental Design (CAED) and is lead by an academic program coordinator, with four additional faculty members. The Master of Science in Construction Management will differ from the undergraduate degree, as it will be focused on Corporate Leadership and Research, while reinforcing and enhancing the skillset gained in the undergraduate degree. Graduates with the Master degree will lead large construction firms, industry organizations and practice, as well as research related to the field.

The degree program will focus on three main components; sustainability and sustainable construction management and processes, business practices within the Construction Management industry, and technical construction management expertise such as building science, scheduling and estimating. Further, students will have the opportunity to research industry trends and practices, to better understand the industry and how to improve how construction is managed.

The focus of the program is to adequately prepare students to become construction managers with the required expertise and knowledge to effectively lead construction projects. The program is designed to inculcate in the students the mastery of managing essential aspects of the construction business. The program will include focused training on construction risk management, financial management of construction projects, strategy and organizational leadership, legal aspects of construction, and international construction management. Although certain components of these courses are offered at the undergraduate level, the specific focus, research opportunities or best practice improvements, on these topics does not generally exist in undergraduate coursework. Also, undergraduate programs introduce and reinforce technical skills, while the Master of Science program will prepare the students for leadership positions in today's construction industry, which is characterized by more complex projects, advanced technologies, and increased regulatory requirements.

This program will target three main audiences. The first audience is the recent Bachelor of Science in Construction Management, or a related degree, that wishes to continue and advance their undergraduate education. With over 230 students in the undergraduate

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degree, and considerable enrollment at other potential feeder universities, there is a large pool of potential students among this audience. The second audience is industry professionals that are looking to expand their knowledge base and advance their careers by obtaining a Master Degree. Many companies within the industry will financially support the acquisition of such a degree and will advance the graduate upon completion of their studies. The third audience is students that desire to seek an advanced or terminal degree, such as a PhD in construction management or a related degree.

2. Description of the proposed curriculum.

The Degree Program will have 39 credit hours, with 12 credit hours being dedicated to a Research core, 10 hours of required Construction Management courses including the Graduate Orientation Seminar, 9 hours of elective Construction Management courses, and either 8 hours of Thesis (in the thesis option) or 5 hours of graduate course elective and 3 hours of Construction Management Graduate Capstone. The courses are as follows:

Course Number	Course Name
Research Core – 12 hours	
MATH 50012	Introduction to Statistical Concepts
CMGT 61010	Building Sciences (new course)
AED 60922	Methods of Inquiry in Architectural Studies (2 hour)
AED 60923	Empirical Research in Environmental Design (1 hour)
AED 60930	Applied Research Methods in Arch and Env. Design
Construction Management Required – 10 hours	
CMGT 62110	Advanced Construction Management
CMGT 62107	Advanced Scheduling
CMGT 62105	Construction Contracts and Law
CMGT 51000	Graduate Orientation Seminar (1 hour) (new course)
Construction Management Electives (choose 3 courses) – 9 hours	
CMGT 61041	Advanced Construction Estimating
CMGT 67320	Applied Sustainability in Construction Management
CMGT 62040	Construction Methods Improvements
CMGT 62050	International Construction Management
CMGT 62030	BIM for Construction Managers
CMGT 62060	Negotiation in the Built Environment
CMGT 62070	Engineering Economics and Strategic Decision Making
Thesis Option – 8 hours	
AED 66099	Thesis Preparation Seminar (2 hours)
AED 66199	Thesis I (6 hours)
Non-thesis Option – 8 hours	
	Graduate Elective (5 hours)
CMGT 65000	Master Project in Construction Management (new course)

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As the target audience is three different groups, recent undergraduates, industry professionals, or those seeking to advance towards a PhD, the flexibility of a thesis or non-thesis option will allow these differing groups to choose the path that best suits their goals. The Capstone course in the non-thesis option will be a project-driven course, which will allow the students to gain practical experience and to create a real world simulated deliverable.

The standard Kent State University graduate admission requirements will need to be met, including a GRE of 285, and an English proficiency score for International Students of 6.0 on IELTS or 525 on TOEFFL or other equivalent acceptable score.

3. Administrative arrangements for the proposed program: department and school or college involved.

The program will be housed in the College of Architecture and Environmental Design (CAED), in the Construction Management program. No additional administrative arrangements will be required, beyond those previously dedicated to the Master of Technology program within CAEST and in place within CAED. The Academic Program Coordinator within the Bachelor of Science in Construction Management will assume responsibilities of administering the degree as the Graduate Coordinator. The admissions committee will consist of the Graduate Coordinator; select Construction Management Faculty with Graduate Faculty Status, and the CAED admissions committee, as was previously the model in CAEST for the current Masters of Technology degree.

4. Evidence of need for the new degree program, including the opportunities for employment of graduates. This section should also address other similar programs in the state addressing this need and potential duplication of programs in the state and region.

The majority of the undergraduate degrees offered in Construction Management are a Bachelor of Science, and as such, these graduates that are looking to continue their education, are seeking a Master of Science. Currently, there are no specific Masters of Science in Construction Management degrees offered in Ohio. Although Akron University offers certain Construction Management courses relative to Construction Engineering Technology, it does not offer a Master of Science in Construction Management. Also, the University of Cincinnati and Youngstown State offer Construction Management Bachelor degrees, but do not offer a Master degree. There are four schools in Ohio, Bowling Green, Ohio State, University of Toledo, and Ohio University, which offer degrees similar or related to a Master of Science in Construction Management.

University	Master Degree Awarded
Bowling Green University	Master of Technology Management – Construction Management
Ohio State University	Master of Science Construction Systems Management
University of Toledo	Master of Engineering Technology
Ohio University	Master of Science Civil Engineering (not Construction Management)

Although there are other similar Master of Science programs related to Construction Management in Ohio, our degree is specifically related to Construction Management and has certain differentiating characteristics, which make it unique and desirable for students. First, the students have the opportunity to pursue and participate in the professional training track offered within the program, as recent graduates of a

construction management or related degree program, or as an industry professional with the goal of advancing their career. The applicable skillset taught within the degree will facilitate both of these students. A student seeking to continue their research and academic pursuits through teaching or a PhD will also have the opportunity to gain the necessary learning outcomes to achieve these goals. Second, with the relocation of the academic unit to CAED, there is great opportunity to participate in many practical, real-world training and research endeavors. Specific Core classes related to research, and the Thesis courses are offered in conjunction with the existing CAED Master Degree programs. Construction Management professionals and researchers interact extensively with design professionals, and as such, the learning and research made available by this collaboration will directly benefit the student and the built environment in which they will work or study. Examples of research and collaboration will be in areas such as, performance based buildings, building science and technology, management tools and processes, delivery models, digital fabrication, integrated design, 3-D printing and fabrication, Building Information Modeling, and project stakeholder roles and responsibility assessments. Third, at Kent State University, with many disciplines and course offerings, there are many collaboration opportunities with units such as business geology, biology and others, throughout the university due to this large diversity of academic areas. This facilitates an environment for research and learning beyond our profession, which could lead to groundbreaking, cross-industry findings. Fourth, the course selections within the degree offer practical and research education, balanced for the student depending on their goals, with the flexibility to focus on the specific areas of interest for the student. For example, if a student is interested in pursuing their PhD in Sustainable Building, they can utilize the research and construction management required courses to lay a strong foundation, and then choose additional course related to sustainability within the degree program or across the campus, and finish their studies with a thesis relative to sustainability. The ability to tailor the student's studies to their interests allows for a wide range of learning opportunities.

As we are currently offering the Master of Technology, with a track in Construction Management, with consistently approximately 20 students enrolled, there is a need and interest in our region for this coursework. The construction industry continues to grow not only in Northeast Ohio and around the world. A large international population is currently attending and graduating from the Master of Technology, with a Concentration in Construction Management. Many of these students are seeking a Masters of Science, as they have received a Bachelors of Science, in Civil Engineering. The three target audiences, undergraduates, industry professionals and students desiring a PhD in the future, are all better served through the Masters of Science opportunity.

The tables below, from the Bureau of Labor and Statistics (<http://www.bls.gov/oes/current/oes119021.htm#st>), indicates that Ohio, has among the highest employment level in this occupation and among the highest level of non-metropolitan employment in this occupation, which is Construction Management, in the United States. Not only does this mean that there are many industry professionals that may be interested in advancing in their careers, but that there are also many job opportunities for undergraduate students in Construction Management or other related professions that wish to differentiate themselves in the marketplace by obtaining a Masters of Science upon graduation from their undergraduate degree.

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States with the highest employment level in this occupation:

State	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
California	29,950	1.93	1.11	\$52.04	\$108,240
Texas	26,800	2.32	1.33	\$45.00	\$93,610
Florida	18,020	2.27	1.31	\$43.42	\$90,310
New York	13,900	1.55	0.89	\$54.97	\$114,330
Ohio	9,160	1.74	1.00	\$46.30	\$96,300

Nonmetropolitan areas with the highest employment in this occupation:

Nonmetropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
West Texas Region of Texas nonmetropolitan area	610	2.98	1.71	\$35.41	\$73,640
Northwest Colorado nonmetropolitan area	530	4.60	2.64	\$46.10	\$95,900
Central Kentucky nonmetropolitan area	480	2.70	1.56	\$35.68	\$74,220
North Northeastern Ohio non-metropolitan area (non-contiguous)	460	1.39	0.80	\$50.14	\$104,290
Hill Country Region of Texas nonmetropolitan area	440	2.22	1.28	\$35.59	\$74,030

5. Prospective enrollment.

The current Master of Technology, with a track in Construction Management, consistently has approximately 20 students taking the Construction Management courses, which will be offered similarly in the Master of Science program. As such, a similar expected enrollment will be anticipated as the program shifts to the new degree. The goal of the program initially is 15 students, with sustainable growth to 30 students in the foreseeable future. Further, there are approximately 230 undergraduate students in the Bachelor of Science in Construction Management program, of which a certain number will likely continuing their studies in a specifically named degree program. Also, the current enrollment in the Construction Management Masters of Technology classes also includes a considerable number of international students. As the degree is changed to a Masters of Science and becomes more recognizable and appropriate to industry professionals, it will also likely create a greater number of the students.

6. Special efforts to enroll and retain underrepresented groups in the given discipline.

With the two recently hired staff members, from underrepresented groups, we have a more diverse teaching unit with a focus on outreach to the underrepresented community. Utilizing the opportunities these faculty members offer, we will focus a large portion of our outreach efforts on underrepresented groups. Further, the Academic Unit has a relationship with the ACE Mentoring program in Cleveland, which seeks to place underrepresented groups in Universities surrounding their residences. This has been and will continue to be a recruiting tool for the undergraduate and graduate program as we visit and work within these schools. The number of underrepresented students recruited and retained in our undergraduate program has also increased, and with the focus on this recruitment, this number will likely continue to grow. Certain faculty members have also undergone training relative to retention of underrepresented groups, and have begun to implement what was learned during the training sessions.

7. Availability and adequacy of the faculty and facilities available for the new degree program.

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There are three faculty members currently teaching within the Master of Technology with a specialization in Construction Management degree program and one planning to teach courses in the program. This would allow for an easy transition to teaching in the Master of Science program. Certain of the degree courses, both undergraduate and graduate, will be taught by faculty members outside of the academic unit. Further, the faculty members are more than adequately qualified to teach within the new degree program, based on earned degrees relative to the subject matter and each having considerable professional experience.

Faculty Member	Degrees	Courses Taught
George F. Bigham III	Masters of Construction Science and Management Clemson Univ., PhD (ABD) Technology Management (CMGT) Indiana State Univ.	CMGT 62110 CMGT 62107 CMGT 62105 CMGT 67320 CMGT 62050 CMGT 51000
Dr. Simon Adamtey	PhD Technology Management (CMGT) Indiana State Univ.	CMGT 61041 CMGT 62030
Dr. Lameck Onsarigo	PhD in Technology Management (CMGT) Indiana State Univ.	CMGT 62040 CMGT 65000 CMGT 62070
New TT Hire (Fall 2019)	PhD Related Field	CMGT 61010 CMGT 62060

Also, as previously mentioned, the Construction Management program has moved to CAED, and is housed in the new, state-of-the-art, high-tech architecture building. This building includes considerable research labs, construction labs, computer labs, and collaboration opportunities. The building is a living lab, with many of the systems and structures of the building exposed for study and analysis. With a proposed LEED platinum rating, this building also offers the opportunity to understand the integrated design process, and the outcomes of this effort in a sustainable building.

8. Need for additional facilities and staff and the plans to meet this need.
As the Master of Technology with a track in Construction Management is currently offered within the academic unit, the same faculty, including the newly added faculty members, and the new facilities, no additional faculty, facilities or staff will be required.
9. Projected additional costs associated with the program and evidence of institutional commitment and capacity to meet these costs.
As the Master of Technology with a track in Construction Management is currently being offered, no additional costs will be required. There are currently three faculty members with Graduate Faculty Status, teaching courses within the Master of Technology program, with a new faculty member anticipated, and as such, the institutional commitment will remain the same.