

# **PUBLIC DISCLOSURES**

## **Haile College of Business**

### **Bachelor of Science in Construction Management**

#### **Objectives of the Program:**

*The Construction Management Program's Mission: "Our mission is to prepare Construction Management graduates for professional excellence through an innovative curriculum creating well prepared graduates who are technically and administratively competent, and who will be desired by leading companies in the different fields of construction management."*

*Our mission is achieved by providing:*

- State-of-the-art knowledge and technologies meeting market demand
- Real-world case studies and interaction with the construction industry
- Effective and timely advising and counseling to enhance learning and ensure planned progress
- Persistent focus on the importance of ethical practices and professionalism in the construction industry.

The Construction Management Program, like the University, strives to be student centered in its education with the end goal of providing a well-rounded experience that has both the technical knowledge required but also the requisite background in communication, math, sciences, and the humanities necessary for them to be productive members of our society.

#### **Program Admission Requirements:**

The Construction Management Program does not have special or secondary admission requirements. Students who are admitted to NKU are able to declare Construction Management as their major. For current admission requirements for Northern Kentucky University, please visit: <https://www.nku.edu/admissions/undergrad/admission-process/standards.html>

#### **Program Assessment Measures:**

The Construction Management Program is accredited by the American Council for Construction Education and as such reports out specific Assessment Measures related to the required 20 Student Learning Outcomes (SLOs) defined by ACCE. To measure these SLOs, several instruments are used including both direct and indirect measures. These measures include a senior exit survey administered by the faculty, results from the American Institute of Constructors' Associate Constructor (AC) Certification Examination, and specific assignments/exams/projects given in a specific course.

## **Information Obtained from Assessment Measures:**

Results from the most recent year of Senior Exit Surveys:

- **Communication Skills** – on average, students ranked communication skills (oral, written, graphic, and listening) between Above Average (2) and Excellent (1) with an average score of **1.9**.
- **General Project Administration** – on average, students ranked project administration skills (layout, working with subcontractors, payment, and field records) between Above Average (2) and Excellent (1) with an average score of **1.7**.
- **Safety Management** – on average, students ranked safety management skills (knowing OSHA standards, safety, health, and hazards on a job site as well as site specific safety plans) between Above Average (2) and Excellent (1) with an average score of **1.5**.
- **Costing and Cost Control** – on average, students ranked costing and cost control skills (establishing budgets, forecasting expenditures, and work breakdown structures) between Above Average (2) and Excellent (1) with an average score of **1.9**.
- **Project Scheduling** – on average, students ranked project scheduling skills (procurement schedules and create, monitor, and update project schedules) between Above Average (2) and Excellent (1) with an average score of **1.8**.
- **Surveying and Layout** – on average, students ranked surveying and layout skills (horizontal and vertical control based on construction drawings and site survey) between Above Average (2) and Excellent (1) with an average score of **1.7**.
- **Quantity Take-Off and Estimating** – on average, students ranked quantity take-off and estimating skills (quantity take-offs, analyzing productivity and pricing, and value engineering) between Above Average (2) and Excellent (1) with an average score of **1.9**.
- **Materials and Methods** – on average, students ranked material and methods knowledge (understanding the divisions of CSI and construction scientific principles related to materials and methods) between Above Average (2) and Excellent (1) with an average score of **1.8**.

## **Actions Taken as a Result of Assessment Data Collected:**

The Construction Management Program utilizes this information collected from the senior exit interview and compares that with results from each of the 20 identified Student Learning Outcomes (SLOs).

1. ***Create written communications appropriate to the construction discipline.***
  - Overall, students achieved and surpassed the target goal of 70% of students scoring 70% or better for the course reports. For the six semesters included in the period between Fall, 2016 and Spring 2019, 100% of the students

enrolled scored better than 70% in five of the semesters. 91.67% scored better than 70% on the course report in Fall, 2018.

**2. Create oral presentations appropriate to the construction discipline.**

- Since the presentation scores of all students in CMGT 415 met the minimum target level requirement of 75%, its level should also be discussed. Exit interview results show incremental improvement in oral communication skills over the time. However, there are still rooms for improvement and the oral communication skills should be addressed among more construction management courses. Also, adding principles of oral communication skills to the syllabus of courses as a separate topic could improve the perception of our students. Moreover, we need to incentivize students to have a higher participation in exit interview to make the results more reliable.

**3. Create a construction project safety plan.**

- Continuation of the current instruction methods and assessments for this course should continue. Consideration be given during the next cycle of evaluations that the bar for the assessment on the project safety plan be raised to at least 75% (currently at 70%).

**4. Create construction project cost estimates.**

- Covid restrictions necessitated the use of projects and homework as the primary means of assessment over the last three evaluation semesters; test and exams, particularly of the face to face variety, were not used for measurements. That component should be added and used to evaluate the effectiveness of changes made for achievement of this SLO.

**5. Create construction project schedules.**

- Performance on the final exam in spring 2020 was an issue in the class. The average final grade on the final exam was 74.8% with a range between 93.3% and 57%. Additional attention was given to add a refresher to the course; however, with the shift to fully online delivery after spring break, student participation dropped significantly. Continue to monitor and hope this is a reflection of COVID and not the steps taken to address low final exam scores.

**6. Analyze professional decisions based on ethical principles.**

- In the future, this course will only be offered in person. Despite this, it is recommended that Canvas be utilized more as a tool for students to have more online access of course materials. Course resources should be uploaded to Canvas as well as practice exams

**7. Analyze construction documents for planning and management of construction processes.**

- In the future, this course will only be offered in person. Despite this, it is recommended that Canvas be utilized more as a tool for students to have more online access of course materials. Course resources should be uploaded to Canvas as well as practice exams.

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

- At this point, the plan is to continue as is and work to have students prepare for and take the AIC Exam more seriously. Starting in 2021/2022 academic year, changes to the senior exit survey will be implemented to better reflect the SLOs so an indirect assessment can be used going forward.

**9. Understand construction management skills as a member of a multidisciplinary team.**

- Performance on the final exam continues to improve in the class. The average final grade on the final exam was 83.02% with a range between 100% and 54%. Students are reminded to review the study guide for the AIC exam, in addition to reviewing the video lectures posted on the Canvas course management system as a review for the exam.

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

- In Performance on the CAD Exam is an issue in the class. The average final grade on the exam was 72.5% with a range between 95% and 50%. Performance on the REVIT Exam was better than the CAD. The average final grade on the exam was 87.5% with a range between 95% and 80%.

**11. Apply basic surveying techniques for construction layout and control.**

- Consider adding additional study sessions to CMGT 220 both in person and via Zoom with recording for students that are working. Restart the Field Exercise #6 assignment for Spring 2022

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

- In Performance on the final exam continues to improve in the class. The average final grade on the final exam was 83.02% with a range between 100% and 54%. Students are reminded to review the study guide for the AIC exam, in addition to reviewing the video lectures posted on the Canvas course management system as a review for the exam.
- Future developments in teaming agreements and innovative types of contracts resulting therefrom will be included in class discussions to ensure students are kept abreast of the latest developments in the construction industry and the trends resulting from such innovative contractual arrangements.

**13. Understand construction risk management.**

- In Future courses will all be offered in person, due to the type of material covered. It seems like students did well with the online version of this course. It is possible that portions of the class could be offered online in the future. Exams can be offered online, and course materials should be posted to Canvas as a resource for students. This class needs to maintain a small class size in order for students to successfully participate in discussions and group activities.

**14. Understand construction accounting and cost control.**

- In Construction company failures occur, on average, at twice the national average rate for failures of companies in all other industries combined. Cost control and accounting tools, and understanding the information provided by those elements, can help lower the failure rate when the tools are understood and utilized. Currently, the focus of cost control tools such as cash flow analysis and those required to complete the final project in this course focus on their use in project control post start of project execution. Although this SLO is at the understand level, additional focus on the use of the tools as pro-forma mechanisms used to evaluate future requirements (particularly, monetary) before the need occurs should get more coverage and emphasis in the course. Additionally, discussion of strategic decisions like those discussed in the CMGT 420 final project (real profit vs expected profit, interest rates/cost of money, monetary needs for project execution and funding methods) should be incorporated as elements of CMGT 431, Capstone, to reinforce the reinforce the concepts, particularly as they help in prevention of construction management companies' failure and foreclosure. This requires coordination with other CM faculty.
- It was noted in the last evaluation that while students did successfully demonstrate understanding of linear periodic cash flow concepts and net present value analysis and were able to set up the problem (s) and perform the calculations, many did not convert the annual interest rate to the proper rate needed for the pay period increment. This received for emphasis in classes during this evaluation period by more examples, discussion, and class work that emphasize this step. This should continue.

**15. Understand construction quality assurance and control.**

- In Concrete mix design, concrete cylinder tests, and construction of masonry assemblies used to perform flexural, compression, and shear tests are examples of other quality control measures that have been taught and performed by students in various iterations of CMGT 120, Construction Materials. Future courses can measure performance of students on these elements. Quality control is also discussed the course units on metals, site work, and concrete ingredients. Assessment is done through exams, quizzes, and other activities. Future iterations of the course can also capture data on student performance of students on these elements for assessment.

**16. Understand construction project control processes.**

- In Efforts that not only exposed students to processes, skills, and techniques used to control construction budgets when bids are accepted and/or won, but also fosters a "cost control attitude" should be incorporated into future iterations of the course. Students would be well served being exposed to content that emphasized the need to closely watch and manage all cost and financial aspects associated with projects in addition to its schedule, administrative, and other managerial considerations. Many are not exposed to this emphasize until later in their careers. Efforts like comparisons of

front-end loading schedule of values to normal distribution schedule of values and impact of interest rates on the real monetary value of cash flow payments vs expenses streams that show the impact of profit on small changes in revenue can help students understand how important a cost control attitude can be toward a company's success. Other content and tools that help with this should be investigated and added to the course as appropriate.

- In order to increase the performance on final exams, the next iteration of the CMGT 420 course should utilize additional quizzes and homework that emphasize retention of noncomputer/manual manipulations of the course's basic concepts. Final project components can also be evaluated to determine areas where non-computer computations and assessments can be incorporated.

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

- In Performance on the final exam continues to improve in the class. The average final grade on the final exam was 83.02% with a range between 100% and 54%. Students are reminded to review the study guide for the AIC exam, in addition to reviewing the video lectures posted on the Canvas course management system as a review for the exam.
- Examples from legal cases (Construction claims monthly) will be added to analyze recent lawsuits resulting from disputes among contract parties will be added to emphasize the need for clear, timely, and comprehensive communication among contract parties to ensure issues are resolved at the lowest administrative level rather than being escalated to the highest levels resulting in major disputes.

**18. Understand the basic principles of sustainable construction.**

- In Although sustainable construction was introduced in CMGT 101 and CMGT 305 further this introduction through different strategies to minimize energy performance and improve air quality, an elective course can address this topic more comprehensively.
- CMGT 101 could successfully introduce the topic since 95.5% of students scored 75% or better.
- Adding more case studies to CMGT 305 can improve student learning and convey sufficient information to the students.

**19. Understand the basic principles of structural behavior.**

- In the future, this course will be offered online or in person with limited class size. Additionally, exams will always be in a multiple-choice format. All online class lectures will be video recorded and uploaded on Canvas so that Students can review the materials at their leisure. Exams will be open book and open note.

**20. Understand the basic principles of mechanical, electrical, and piping systems.**

- COVID-19 could have affected the aforementioned results for CMGT305. Therefore, the students learning outcome trend in upcoming years will be more reliable; For instance, a couple of students missed the final exam in Fall 2020 which affected the percentage of students scored 75% or better. Also, adding more local, national, and international examples of emerging trends in mechanical and electrical systems can prepare the students for their future endeavors.
- It is planned to participate in Mechanical Contractor Association of America (MCAA) every year to assist the students to retain the concepts they learned in this course better and longer. NKU student chapter has been awarded the 2020 emerging chapter grant by MCAA. They participated in great futures forum 2019 and submitted the proposal for the competition. However, the MCAA 2020 Annual Convention has been cancelled due to the pandemic.
- In the future, whether the CMGT306 class is offered in person or online, all exams will be multiple choice. Course resources will be uploaded to Canvas. It is recommended to provide students with practice exams.

**Student Achievement:**

Construction Management students have been very successful as recipients of scholarships from NKU, and specifically through the CM program and the Haile College of Business. For the 2021-2022 academic year, more than 10% of the CM students were awarded competitive scholarships totaling more than \$30,000.

**Rate and Types of Employment of Graduates:**

| <i>Job Title</i>             | <i>Company</i>               | <i>Sector</i>            |
|------------------------------|------------------------------|--------------------------|
| Assistant Superintendent (1) | Goettle Construction         | Commercial / Industrial  |
| Assistant Superintendent (2) | Model Group                  | Commercial               |
| Certification Manager - Iron | McDaniel Steel Erection      | Commercial               |
| Engineer Specialist          | Duke Energy                  | Industrial               |
| Estimator/Project Manager    | KEP Electric                 | Residential              |
| Field Engineer (1)           | Whiting-Turner               | Institutional            |
| Field Engineer (2)           | Century Construction         | Commercial / Residential |
| Field Engineer (3)           | Perkins Carmack Construction | Commercial               |
| Inside Sales Support         | RBI Solar                    | Utilities                |
| Inspector                    | Ultra Technics Construction  | Residential              |
| Project Engineer (1)         | Performance Contracting Inc  | Commercial               |
| Project Engineer (2)         | Building Crafts Inc.         | Commercial               |
| Project Engineer (3)         | Baker Concrete Construction  | Commercial               |
| Project Engineer (4)         | Al. Neyer                    | Commercial               |
| Project Engineer (5)         | Conger Construction Group.   | Commercial               |
| Project Engineer (6)         | The Harper Company           | Heavy/Highway            |

|                                                                                                                                                                                                                                    |                      |                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------|
| Project Engineer (7)                                                                                                                                                                                                               | HP2X Construction    | Commercial / Industrial |
| Project Manager                                                                                                                                                                                                                    | Triton Services inc. | Utilities               |
| Project Superintendent                                                                                                                                                                                                             | Paul Hemmer Company  | Commercial              |
| Quality Control Technician                                                                                                                                                                                                         | Hilltop Companies    | Commercial              |
| Three students were current co-ops and were still interviewing at the time of the senior exit interview (2 weeks prior to graduation). 87% placement 3 weeks prior to graduation and 100% placement within 2 months of graduation. |                      |                         |

**Data to Support Qualitative Claims Made by the Program:**

Specific data is available upon request. This summary data is provided to give a snapshot of where the program stands today. Please feel free to reach out directly to the Construction Management program for more information.