

**Student Outcome  
&  
Program Assessment**

**Construction Management**

**March 2007**

**Department of Technology  
Minnesota State University Moorhead**

## **ASSESSMENT PLAN**

### **Construction Management**

### **Department of Technology**

#### **MINNESOTA STATE UNIVERSITY MOORHEAD MISSION STATEMENT**

The mission of Minnesota State University Moorhead is to foster excellence in teaching and learning. The University strives to provide an educational environment that supports intellectual development, that welcomes diversity, and that develops the skills and talents of women and men so that they have the capacity to live usefully, act responsibly, and be learners all their lives. The academic programs at the University are founded upon a common liberal studies experience and emphasize developing the unique talents of each person. The University provides baccalaureate-level programs in the liberal arts, natural and social sciences, teacher education, business and technology, the fine arts, and professional areas. It provides selected graduate programs in response to regional needs.

The University encourages scholarly and creative endeavors that promote a commitment by faculty and students to their disciplines, to continuing professional development, and to excellence in learning.

The University enhances the quality of life in the region with the professional, cultural, and recreational services offered by its students, faculty, and staff.

Minnesota State University Moorhead is one of seven comprehensive Minnesota state universities established to provide the citizens of Minnesota access to quality educational programs at moderate cost. Minnesota State University Moorhead's primary responsibility is to provide baccalaureate programs to residents of northwest and west central Minnesota. Through tuition reciprocity agreements, the University also provides educational services to residents of several regional states and one province.

#### **MINNESOTA STATE UNIVERSITY MOORHEAD - AIMS**

1. To give the highest priority to continuous improvement in learning and teaching.
2. To provide instruction at all levels that stimulates and promotes commitment to life-long learning and to open inquiry, that promotes development of higher order thinking skills and of multicultural, global and international perspectives. Further, to provide instruction that encourages and empowers students to contribute as educated, compassionate, and responsible citizens within their communities, states, nations and the world.
3. To provide a strong liberal studies foundation for all undergraduate programs.

4. To incorporate instruction in all majors that provides breadth and depth in the discipline as well as recognition of the ethical bases of that discipline.
5. To provide instruction in graduate level programs that promotes increased depth in disciplinary or interdisciplinary studies and professional specialization.
6. To ensure that academic programs are accessible to our diverse constituencies at moderate cost.
7. To ensure a campus climate that embraces diversity and bases relationships on civility and tolerance and that acknowledges the perspectives of women, minorities and non-western cultures.
8. To provide higher education opportunities with appropriate support and encouragement for all students including international, nontraditional and traditionally under-represented groups.
9. To provide support and encouragement for faculty development including scholarship, creative activity, research and public service that enriches the individual and the institution, and that promotes the educational and economic development of the service region.
10. To provide support personnel, facilities, and resources that enhance and complement the academic experience.
11. To provide students a range of co-curricular and extra-curricular activities as well as opportunities related to community service and leadership as a means of developing social awareness and enhancing the quality of their lives and developing their potential to thrive in a changing world.
12. To provide service to the region in the form of professional, academic and recreational activities, and, especially, to be a center of cultural activity for the region.

## **COLLEGE OF BUSINESS AND INDUSTRY PROGRAM MISSION**

The College of Business and Industry, building a strong foundation of liberal studies, provides professional career and leadership preparation through student-centered learning that incorporates technology, experiential learning and interaction with industry and community.

## **COLLEGE OF BUSINESS AND INDUSTRY GOALS**

- Goal #1 To prepare students for fulfilling and productive careers.
- Goal #2 To encourage and support faculty development in teaching, advising, service, scholarship, and creative activity.
- Goal #3 To employ resources to enhance and complement the academic experience.
- Goal #4 To provide service and educational outreach to the region.
- Goal #5 To engage in an ongoing process that achieves and maintains high professional standards.
- Goal #6 To contribute to a strong liberal studies foundation for undergraduate programs.
- Goal #7 To embrace diversity and base relationships on tolerance, civility, and affirmation.

## **CONSTRUCTION MANAGEMENT PROGRAM ASSESSMENT**

Assessment of the Construction Management program must satisfy two entities. First and foremost, assessment is a requirement of the American Council for Construction Education (ACCE) and must meet its criteria if the program is to continue as an accredited program. Since we are the only accredited Construction Management program in Minnesota, we feel it is imperative that we maintain accreditation. ACCE requires a comprehensive assessment plan including student performance outcomes and program outcomes. In addition, Minnesota State University Moorhead (MSUM) requires that all degree-granting programs have a student outcomes assessment plan. This assessment plan is designed to satisfy both entities. The CM program mission statement, goals, objectives, and performance measures are detailed further in this document.

## **CONSTRUCTION MANAGEMENT MISSION STATEMENT**

The mission of the Construction management program is three fold.

- To maintain a nationally accredited construction management program, which will produce graduates who will have the technical, managerial and general knowledge necessary to enter and advance professionally in the construction industry.
- Provide an environment, which encourages students and faculty to engage in professional development, critical thinking, and creative endeavors.
- Promote continuous improvement of teaching, learning and program curriculum.

**CONSTRUCTION MANAGEMENT PROGRAM GOALS AND OBJECTIVES**

The program of study is designed to prepare a professional constructor who possesses skills and knowledge acquired through education and on-site experience necessary to manage construction processes including bid preparation, project acquisition, project management, safety, and supervision of the construction process.

<b><u>GOALS</u></b>	<b><u>STUDENT OUTCOMES/OBJECTIVES</u></b>	<b><u>MEASUREMENT</u></b>	<b><u>FREQUENCY</u></b>
<p><b>Goal # 1</b></p> <p><b>Provide a quality Construction Management program.</b></p> <p>Implement a Continuous Improvement Plan to enhance quality construction management curriculum that blends the fundamentals of construction management, business management, and engineering concepts.</p>	<p><b>1. Communication skills</b> The student will apply oral, written, graphic, and listening skills to enhance the communication process.</p> <p><b>2. Design/Engineering Concepts and Associated Math</b> The student will apply scientific knowledge to applications of applied mechanics, engineering design fundamentals, and associated mathematics to the construction practices and processes.</p> <p><b>3. Management Concepts &amp; Philosophies</b> The student will apply the principles and philosophy of general and human resource management systems, accounting, economics and ethics to the construction industry. (Including team building, leadership concepts/skills, and the Construction Code of Conduct).</p> <p><b>4. Construction Materials and Methods</b> The student will demonstrate knowledge of the science of materials and methods of construction as they apply to the 16 Construction Specifications Institute (CSI) Divisions designated for the construction industry.</p>	<p>CPC Examination Capstone Evaluation Internship Evaluation</p> <p>CPC Examination</p> <p>CPC Examination Internship Evaluation</p> <p>CPC Examination Internship Evaluation</p>	<p>Each Semester Each Semester When Completed</p> <p>Each Semester</p> <p>Each Semester When Completed</p> <p>Each Semester When Completed</p>

	<p><b>5. Estimating, Plan Reading and Bid Process</b> The student will demonstrate estimating skills including interpretation of plans and construction documents, performing quantity take-offs, analyzing productivity and pricing, identifying appropriate cost codes, applying value engineering, and developing detailed project proposals and documentation necessary for construction job acquisition and completion.</p> <p><b>6. Budgeting/Cost Accounting, Cost Control &amp; Close-out</b> The student will be able to prepare complete cost control processes including the ability to establish a budget, develop a work breakdown structure, prepare cost reports, and forecast expenditures at completion of the project.</p> <p><b>7. Scheduling &amp; Project Control</b> The student will prepare a complete construction project schedule showing the logical sequence of activities and time duration, develop a procurement time table, and establish a project plan in order to monitor progress and update the schedules</p> <p><b>8. Safety</b> The student will identify and execute construction safety standards including the ability to interpret the OSHA construction standards, establish safety and health procedures on the job site, perform hazard material and process analysis and enforce safety procedures.</p> <p><b>9. Construction Surveying and Layout</b> The student will be able to the established procedures for</p>	<p>CPC Examination Capstone Evaluation Internship Evaluation</p> <p>CPC Examination Internship Evaluation</p> <p>CPC Examination Capstone Evaluation Internship Evaluation</p> <p>CPC Examination Internship Evaluation</p>	<p>Each Semester Each Semester When Completed</p> <p>Each Semester When Completed</p> <p>Each Semester Each Semester When Completed</p> <p>Each Semester When Completed</p>
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	<p>identifying distance and elevations from known points and layout the project in accordance with the design drawings, and site information.</p> <p><b>10. Project Administration</b>  The student will demonstrate knowledge of overall field administration at the construction site including developing a site plan, evaluating vendors and subcontractors, processing payment applications, maintaining field records such as purchase orders, changer orders subcontract agreements, shop drawings, as-built drawings, daily job reports and construction reports.</p> <p>❖ An overall assessment of the curriculum content will be conducted to determine how well the students are prepared in the ten content areas list above.</p>	<p>CPC Examination Internship Evaluation</p> <p>CPC Examination Capstone Evaluation Internship Evaluation</p> <p>Graduate Exit Survey CM Alumni Survey Advisory Board</p>	<p>Each Semester When Completed</p> <p>Each Semester Each Semester When Completed</p>
<p><b>Goal # 2</b>  Increase the numbers of Construction Management majors to 150 students over a 5-year period (2005-2010).</p>	<ol style="list-style-type: none"> <li>1. Recruit undeclared majors at MSUM to declare a major in Construction Management</li> <li>2. Recruit transfers from Community and Technical Colleges.</li> <li>3. Visit area high schools and recruiting fairs to increase number of new students.</li> </ol>	<p>Monitor and track CM Enrollment Numbers of the five-year period. Reference the 5-year plan.</p>	<p>Annually</p>

<p><b>Goal # 3</b> Enhance student learning, faculty teaching effectiveness, and professional development.</p>	<ol style="list-style-type: none"> <li>1. Evaluate quality of student learning and teaching effectiveness.</li> <li>2. Evaluate quality of department instruction and lab facilities.</li> <li>3. Increase faculty involvement in research and publications.</li> <li>4. Continuous faculty growth and development.</li> </ol>	<p>Department Senior Exit Survey</p> <p>Department Senior Exit Survey</p> <p>Tenure and Promotion</p> <p>Tenure and Promotion</p>	<p>Each Semester</p> <p>Each Semester</p> <p>Annually</p> <p>Annually</p>
<p><b>Goal # 4</b> <b>Raise a Minimum of \$50,000 per year from outside sources.</b></p> <p>Increase resources and support for the CM program</p>	<ol style="list-style-type: none"> <li>1. Identify future needs and requirement related to equipment, materials, lab facilities, travel, professional development, etc.</li> <li>2. Increase industry interaction and support.</li> <li>3. Promote a CM Scholarship program.</li> </ol>	<p>CM Faculty Advisory Committee</p> <p>Advisory Committee</p> <p>Graduate Exit Survey</p> <p>Advisory Committee</p>	<p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Each Semester</p> <p>Annually</p> <p>Each Semester</p>

## **LEVELS OF ASSESSMENT AND TYPES OF ASSESSMENT MEASURES**

### **Level I      Student Outcome/Competency Assessment**

#### **1. Certified Professional Constructor (CPC) Level I Exam.**

- Students will sit for the 8-hour certification Exam as a requirement of CM 496 Capstone Experience. The American Institute of Constructors (AIC) offers the exam. Successful candidates will be granted Level I Certification by AIC. CM program's goal will be to meet or exceed the national average each test cycle in 5 out of 10 content areas. Students will be required to sign a waiver so that the program can obtain individual results as well as composite results for each test period.

- Assessment Measure

The individual and composite results will be analyzed. Areas of concern will be identified and analyzed. Appropriate changes will be implemented.

#### **2. Capstone Experience Evaluation**

- The capstone experience is intended to develop a higher level of comprehensive understanding of the construction process and problem solving that begins with the conception and progresses through the completion of the construction project. This experience utilizes knowledge and concepts developed in earlier coursework and it enhances the student's understanding of the interrelationships between design, estimating, scheduling, and contracts. The course will simulate a construction project. Each student will be totally responsible for

designing, developing, estimating, scheduling, contracting, and administering the works for the completion of a construction project. The student will complete a major portion of the course requirement through the use of applicable computer programs, i.e., AutoCAD, Primavera, Expedition, and Timberline. The course will further develop and utilize oral and written communication skills, which have become a major factor in determining the success of the construction managers and executives. Assessment by the instructor of the CM 496 Capstone Experience will include oral, written and technical knowledge and skills evaluation.

The goals of the CM program are two fold.

1. For the students each semester completing the Capstone project the average score on each of the criteria evaluated will be a minimum of 8/10 possible points.
2. For the students each semester completing the capstone project the average total score on the project evaluation will be a minimum of 120/150 possible points.

- Assessment Measure

1. CM Capstone Project Evaluation

### **3. Internship Evaluation**

- At the completion of the internship experience the intern's supervisor will be asked to complete an internship evaluation of the students competencies. As an indirect measure of student outcomes, the student

will be asked to complete an essay explaining what was learned and observed during the internship. The employer evaluation and essay will be compared and discussed by the student and his/her advisor. The CM faculty will track trends and areas of concern.

- Assessment Measure
  1. Internship Employer Evaluation
  2. Student Essay

## **Level II      Program Assessment**

### **1. Post-Major Declaration Assessment**

#### **A. Graduation Application and Senior Exit Survey**

- Conducted by department to give the student an opportunity to identify the strengths and weaknesses of the program and department. Students will evaluate how well the program prepared them in the ten content areas.
- Assessment Measure

#### Senior Exit Survey

The department will analyze surveys to identify strengths and weaknesses. The CM faculty will review the results to determine what actions need to be taken.

### **2. Post Graduation Assessment**

#### **A. Graduate Placement**

Each semester the CM program tracks where the graduating seniors are employed and the starting salaries. Each student will develop a career resume as part of the graduate placement process. See section on Resume Booklet/ Electronic Resumes.

- Assessment Measure

The CM faculty will verify that CM graduates are getting jobs for which they were prepared. The percent of the graduating seniors accepting employment each semester and the average starting salary will be tracked.

## B. Alumni Follow-Up

- The Construction Management program conducts an alumni survey for graduates every two years to determine the continued success of graduates and suggested improvements to the CM program. Alumni will evaluate how well the program prepared them in the ten content areas.

- Assessment Measure

### Alumni Survey

The results will be analyzed and trends will be identified. With input from the advisory committee the faculty will determine appropriate action.

## C. Employer Survey

- An employer survey accompanies the alumni survey mailings. The survey will help to determine the continued success of the graduates and needed changes from the employer's perspective. Employers will evaluate how well the program prepared employees in the ten content areas.

- Assessment Measure

The Alumni's supervisor will evaluate the preparedness of the graduate and identify strengths and weakness of technical skills. Program changes will be identified and appropriate actions will be taken.

### **3. Advisory Board**

- The advisory meets once a year. A second meeting is scheduled if needed. The Board communicates through email to work on committees and projects. Board actions and suggestions are recorded in the Board minutes each meeting.
- Assessment Measure

As part of the general assessment report, the CM faculty will report status and progress for each Advisory Board goals and objectives as outlined in this document and the five-year plan.

  - See Attached Five Year Plan
  - See Advisory Board minutes.

## ASSESSMENT SCHEDULE

The ultimate responsibility for the assessment of the Construction Management program rests with the faculty and staff of the Department of Technology. However, the faculty is subservient to the input from the construction industry and their needs. The Industry Advisory Board is consulted on a regular basis. The students' expectations of the program, employers, graduates, and accreditation bodies are each contributing factors for the final determination of curriculum characteristics and program description. To assure that the assessment process is completed, the following scheduled has been developed.

<b>Month</b>	<b>Assessment Activity</b>
August	<ul style="list-style-type: none"><li>• Compile assessment data for assessment report.</li><li>• Verify spring and summer graduate placement.</li></ul>
September	<ul style="list-style-type: none"><li>• Complete the assessment report by the end of September, which will include recommendations for improvement, based on the CPC, capstone and internship evaluations.</li><li>• Submit assessment report to the MSUM Assessment Committee and Advisory Board.</li><li>• Verify 30-day fall semester CM enrollment</li><li>• Compile resume booklet</li></ul>
October	Fall advisory board meeting Send out Alumni and Employer Surveys (every two years)
November	Analyze Advisory Board input from fall meeting

	CPC Fall Exam CM Fall Graduate Exit Surveys Submit Tenure and Promotion document to administration
December	Capstone evaluation
January	Verify fall graduate placement
February	Evaluate Fall CPC Results Verify 30-day spring semester CM enrollment
March	Spring Advisory Board meeting (If required) PDP annual reports as required by the university
April	CPC Spring Exam CM Spring & Summer Graduate Exit Surveys Promotion or Tenure notification by administration
May	Capstone Evaluation Evaluate Spring CPC Results Update and revise Assessment Plan

**OUTCOME ASSESSMENT FOLLOW-UP PROCESS**

To complete the assessment process and provide documentation, the CM faculty has developed a form to use when analyzing assessment data and making recommendations based on the results. This process completes the assessment loop and provides a means to evaluate whether or not the actions taken have had the desired affect.

## **THE CM COURSE SYLLABI AND ITS USE**

Each course offered by the Construction Management (CM) unit is designed for the student to preview-anticipated course content for each specific course. The syllabi provide general information regarding course organization, outcome expectations, assessment, assignments, applicable University and Departmental policies, and schedule of course content including milestone events. The student will refer to the syllabi for many questions of the course. Following is a typical outline for the CM course syllabi preparation:

- I. Instructor Information
- II. Course Description with Prerequisites
- III. Course Information
- IV. Text/References
- V. Accreditation Competencies And Assessment Measures Identified For The Course
- VI. Course Organization Policies
  - A. Student Responsibilities And Instructor Expectations
  - B. Class Attendance and Class Absence
  - C. Assignments and Homework
  - D. Test/Quiz Policy
  - E. Assistance Available Policy
- VII. Topical Content Outline Schedule
- VIII. Other Entries as deemed necessary by the course instructor

## **ELECTRONIC RESUMES**

During the tenure as student status at Minnesota State University Moorhead, the CM student will maintain a career resume. The resume is a critical component of job placement. Starting as a first-year student, resumes are developed and revised through the duration of enrollment by semester. The final resume is published in a booklet or other media for distribution to potential employers throughout the region and nation. The student will find this circulation and exposure a valuable instrument for job selection.

## **CONSTRUCTION MANAGEMENT PROGRAM ADVISORS**

The student will need to make contact early in their enrollment period with the program advisor for assistance and direction while completing the Construction Management program of studies at Minnesota State University Moorhead.

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# Appendix

## Assessment Tools