Annual Outcome Assessment and Continuous Quality Improvement Review 2012

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Spring 2012

This report is the annual evaluation of the CM program by the School Director.
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I. Program History, Context and Mission

History of the CM Undergraduate Program

Construction Management at Michigan State University has provided national leadership since 1948 and our curriculum has matured over those years into one of the best available. We are accredited by the American Council for Construction Education (ACCE) attesting to the strength of our academic program. Our students take classes in management, contracts, finance, estimating, scheduling, real estate, structural design, accounting, building codes, business law, safety, and materials. We also have an excellent internship program that provides first-class opportunities for our students to receive "hands on" real-world experiences. The students in Construction Management are given a world-class opportunity to learn all about the management aspects of construction. After graduation an excellent array of employment opportunities is available with admirable starting salaries, most with fast-track advancements.

This report is designed to inform students, employers, and the public of the principles that guide the Program, and the experience of students currently in the Program or recently graduated. The Construction Management Program is guided by the missions and objectives listed below:

MSU Mission Statement

The following statement was approved by the Board of Trustees on April 18, 2008. Michigan State University, a member of the Association of American Universities and one of the top 100 research universities in the world, was founded in 1855. We are an inclusive, academic community known for our traditionally strong academic disciplines and professional programs, and our liberal arts foundation. Our cross- and interdisciplinary enterprises connect the sciences, humanities, and professions in practical, sustainable, and innovative ways to address society’s rapidly changing needs.

As a public, research-intensive, Land-Grant University funded in part by the state of Michigan, our mission is to advance knowledge and transform lives by:

- providing outstanding undergraduate, graduate, and professional education to promising, qualified students in order to prepare them to contribute fully to society as globally engaged citizen leaders

- conducting research of the highest caliber that seeks to answer questions and create solutions in order to expand human understanding and make a positive difference, both locally and globally
• advancing outreach, engagement, and economic development activities that are innovative, research-driven, and lead to a better quality of life for individuals and communities, at home and around the world

Source: http://president.msu.edu/mission/

School of Planning, Design and Construction Mission and Goals

The School offers a university education through four accredited professional baccalaureate degree granting majors: Landscape Architecture (est. 1898), Interior Design (est. 1935), Urban and Regional Planning (est. 1946), and Construction Management (est. 1948). The educational program has several goals.

The educational component will be realized through a teaching philosophy which embodies six fundamental themes expressed in the activities of faculty and students both in the classroom and in the community. Undergraduate education shall seek to:

I. Exhibit the seamless integration of our majors through a blend of the planning, design and construction processes in our courses and provide for integrative learning experiences across our majors.

II. Commit our faculty and students to an in depth understanding of knowledge and skills within their chosen profession including cutting edge knowledge and its use in contemporary professional practice;

III. Foster professional ethics and values for a global society and maintain the tenets of professional accreditation;

IV. Value direct engagement with our partners in practice, in local and national communities, and the world and engage students in applied real-world learning experiences;

V. Promote environmental, social and economic sustainable principles of the built and natural environment; and

VI. Nurture a creative spirit of innovation regarding the planning, design and construction processes, communication, and teamwork.

As part of the educational process, SPDC faculty value effective and scholarly teaching, innovative teaching and learning practices, and the blend of art and science. These elements are expressed in a breadth of pedagogical approaches from lectures and laboratory to studio and applied learning. In addition, the School emphasizes both self-directed and life-long learning in recognition of the ever expanding state of knowledge.

Finally, the School faculty aims to create an open learning environment which fosters the imaginative engagement of people and ideas within the educational context of academic tolerance, personal integrity, global diversity and the acceptance of environmental and social change.
Mission of Construction Management

The Mission is “to meet the educational needs of the construction industry by preserving existing knowledge, developing new knowledge, and fostering the application of knowledge through undergraduate, graduate, outreach and research programs.”

II. Academic Quality Plan

The Program’s Academic Quality Plan links the University, College and School missions to the Program’s goals and objectives. The Program uses a range of measures to track outcomes and inform decisions that improve courses and meet our goals and objectives.

Program Mission

The mission of the Construction Management Program is to provide a construction education for its students, such that upon graduation students are knowledgeable and prepared to enter careers in construction management. The longer term objective is that, as they gain experience, the CM alumni will take on important leadership positions within construction management organizations.

Program Goals and Objectives

Specific Objectives of the Undergraduate Major are:

- Provide a learning setting where students develop an understanding of the real world of construction management and its requisite content and skills.
- Provide appropriate course content building upon sound fundamentals which is accurate and up to date in construction science and management.
- Provide a learning setting where students can master the material and are encouraged to explore.
- Provide a learning setting where students can develop strong interpersonal, communication, and leadership skills.
- Provide a learning environment where students develop an understanding of the broader social, environmental, economic and business context in which the construction industry operates.

CM Outcome Assessment and Continuous Quality Improvement Process

Construction Management faculty identified key components essential to its outcome assessment and continuous quality improvement process which include: articulation of mission and objectives, program development/implementation, identification and development of assessment instruments, administration of assessment instruments, data analysis, data reporting, strategic planning, identification of change mechanisms,
implementation of changes, reassessment and record keeping. The process is detailed below and summarized in figure 1.

Figure 1. Outcome Assessment and Quality Improvement Process
Program Assessment

The 2010 Academic Quality Plan for Construction Management consisted of the following elements:

- AIC/CPC Results
- Student ratings of courses (SIRS), evaluated by the Director for annual faculty evaluation; by the Associate Director for quality of course offerings; and by the Construction Management faculty as part of the strategic planning process
- Student ratings of courses through online data collection (SOCT).
- Seniors exit survey held annually. Survey covers: advising, facilities, computer access, course availability, instruction, placement, faculty concern for students, communications, student services and study abroad.
- Senior survey of learning outcomes across ten skills.
- Alumni review and feedback every three years

Assessment Results and Implementation

- AIC/CPC Results. In 2010-11, 12 students took the AIC/CPC exam with 8 passing. Construction Management students obtained an average score of 220.8, above the national average.
- Student ratings of courses (SIRS): In 2010-11, of 21 courses, fifteen were rated superior, and six as above average. No Construction Management course was rated as less than average.
- Student ratings through online data collection (SOCT) for 2010-11 showed that of 22 courses with sufficient data, ten had >90% student assessment as effective, four courses with 80-89% effective, five courses 70-79% effective and three courses with 60-69% effectiveness.
- Seniors exit survey held annually. Of the ten measures collected, 2009 data show seven measures rated between Very satisfied (1) and Satisfied (2), and three between satisfied and dissatisfied (Career Advising, Computer Access and Lab Facilities). Strengths included Study Abroad, Advising, Communications and Faculty concern for students.
- Senior survey of learning outcomes: in 2010-11 ten skills were evaluated, with six having positive student ratings between “Contributed a Great Deal” and “Considerable Contribution” and four skills between “Considerable Contribution” and “Some Contribution.” Strengths were teamwork, leadership and applicable knowledge. Concerns raised were for diversity experience, computer skills, written communication and research skills.
- Survey of Employment/Placement: Surveys for Fall 2011 showed average salaries of $50,933 (7 students reporting) with a placement rate of 87% of those responding.
- Alumni review and feedback every three years: Advisory board met in Spring 2011 to provide input to the Program.
III. Student Achievement

This section provides current information about student placement, salaries, awards and scholarships.

Student Employment and Starting Salaries

Survey of Employment/Placement: Surveys for Fall 2011 showed average salaries of $50,933 (7 students reporting) with a placement rate of 87% of those responding.

Student Awards

Among the distinctions and awards received by Construction Management students are:

- 2010 – Residential Competition – 4th Nationally
- 2010 – Outstanding CANR Leadership Award given to CM Senior
- 2011 – Major participants of the 1st ever campus build for Habitat for Humanity (“Whirlpool & Habitat for Humanity – Builders Blitz”)
- 2011 – Commercial Competition Team placed 8th nationally and the Residential Competition Team placed 11th.

Student Scholarships

In Spring 2011, scholarships totaling $62,000 were awarded to 37 undergraduate students in the Construction Management Program. An additional $17,000 was allocated for Study Abroad scholarships for CM students. Scholarships ranged from $500 to $5,000 per student, with 22 students receiving $1,000 or more.

IV: Program Admission Requirements

The Construction Management Program first requires admission to Michigan State University, and later declaration of Construction Management as a major.

Freshman and Transfer Admission

The Office of Admissions and Scholarships handles admission applications for undergraduate students. Please visit the MSU Office of Admissions (admissions.msu.edu) for more information.

Upper Division Review Requirements

While students are Lower Division (freshmen/sophomore level) at MSU they are not required to declare a major preference however they may if they want. A student is either a No-Preference major or has selected a major preference that they intend to pursue. When students reach Upper Division (Junior level with 56 credits) they are required to declare a major.

The number of students admitted to upper division in the Construction Management
Program is limited. Students seeking admission must at least meet the criteria listed below to be considered for admission and to enroll in 300 and 400 level CMP courses*.

1. Completion of at least 56 semester credits
2. A University cumulative grade-point average of 2.3 or higher.**
3. Completion of the following courses with a minimum grade of 2.0 in each:
   - EC 201 or 202 – Must earn a minimum of a 2.0
   - MTH 124 – Must earn a minimum of a 2.0
   - PHY 231 – Must earn a minimum of a 2.0
   - STT 200/201/315 or 421 – Must earn a minimum of a 2.0
4. To be ready for the 300 level courses, the following should be completed: CMP 101, 124, 210, 211, 222 & 230

*Once admitted to upper division, students will be issued overrides into all 300 level courses based on CMP GPA.

**If a student has completed the above with at least a 2.0 minimum GPA in each while maintaining an overall CUM GPA of a 3.0 (although a CUM GPA of a 2.3 CUM GPA is used for minimum consideration for admission, it does NOT guarantee admission. Due to the number of applicants, we use a higher standard than the minimum) and have reached 56 credits, you are admissible into the major. However, admission does NOT guarantee a seat in the 300 level courses. If there is a seat shortage a student’s CMP GPA will determine your ability to get overrides (we rank you in order based on your CMP GPA, all 100 & 200 level courses).

V. Progress Towards 2011-12 Action Plan

Feedback and Progress

1. The faculty have been encouraging students to prepare and take the AIC/CPC exam. This needs to continue each year.
2. Each year the SIRS evaluations are reviewed with each faculty member during their annual evaluation. The program and school expectations are that all courses rank above average.
3. Based on the senior student interviews the program and school initiated interview and resume workshops, 24/7 access to computer labs, an ongoing dialogue with MSU computing regarding software problems, and were successful in purchasing $20,000 of building energy assessment equipment to be used in CM 230 undergraduate and CM 891 courses.

The program and the school are also working to addressing diversity concerns by placing a greater commitment on diversity recruitment through Ms. Robin Rennie (internship, recruitment and special programs), creating and offering a new course
on global professional practice, leadership, computer software skills, and written and verbal communication.

a. It is important that we continue to emphasize the soft skills of communication, leadership, and professional practice. Student Services will continue to work with college and university diversity and pluralism programs to try and recruit a more diverse CM student base.

4. Our work with the CM Alumni Association Board continues to go well. Each faculty member will be expected to attend either the fall or spring CMAAB meetings to talk about their classes and research programs.

5. The fall and spring meetings with the director and program will continue. We need to continue to address the above issues and to monitor their progress.

VI. Director’s Fall 2011 Outcome Assessment and Action Plan

Each fall the Program Director meets regularly with faculty to undertake outcome assessments and to review the available metrics on the curriculum, teaching and student outcomes.

Student Course Evaluations 2010-2011

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior</td>
<td>101, 124, 210, 211, 222, 230, 305, 315, 322, 325, 385, 411, 423, 435, 491</td>
</tr>
<tr>
<td>Above Average</td>
<td>124, 210, 315, 328, 353, 415</td>
</tr>
<tr>
<td>Average</td>
<td>No courses</td>
</tr>
<tr>
<td>Below Average</td>
<td>No courses</td>
</tr>
</tbody>
</table>

Feedback/Action

All of the courses met the program’s and School’s expectations.
Student Instructor Effectiveness 2010-2011

<table>
<thead>
<tr>
<th>Instructor Effective</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;90% agree</td>
<td>101, 222, 230, 305, 322, 325, 385, 401, 411, 423</td>
</tr>
<tr>
<td>80-89% agree</td>
<td>101, 124, 211, 315</td>
</tr>
<tr>
<td>70-79% agree</td>
<td>210, 315, 353, 415, 436</td>
</tr>
<tr>
<td>&lt;70% agree</td>
<td>328, 411, 423</td>
</tr>
</tbody>
</table>

Feedback/Action

Our goal is to have all instructors’ effectiveness to be evaluated above 70%. The faculty need to evaluate 328, 411, and 423 courses and provide constructive feedback to the instructors about how to improve their teaching methods before the next offering of each course.
AIC CPC Exam Results 2010

**Feedback/Action**

Faculty were asked to review the curriculum regarding each area of weakness to determine if additional information or training was needed. The faculty agreed to encourage more students to take the exam. Given that only two students took the exam, this was not considered a major issue.
AIC CPC Exam 2011

Michigan State University (MI003)

CQE Level 1 - Construction Fundamentals - April 2011

<table>
<thead>
<tr>
<th></th>
<th>Year School Candidates</th>
<th>National Candidates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Candidates Teste</td>
<td>16</td>
<td>1259</td>
</tr>
<tr>
<td>Number of Candidates Present</td>
<td>7</td>
<td>768</td>
</tr>
<tr>
<td>Number of Candidates Failed</td>
<td>3</td>
<td>491</td>
</tr>
</tbody>
</table>

Score Summaries

<table>
<thead>
<tr>
<th>Total Score</th>
<th>School Average</th>
<th>National Average</th>
<th>Max Possible</th>
<th>Passing Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Total Score</td>
<td>222.10</td>
<td>216.47</td>
<td>200</td>
<td>210</td>
</tr>
<tr>
<td>Highest Total Score</td>
<td>256</td>
<td>280</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowest Total Score</td>
<td>161</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Area Scores (Averages)

<table>
<thead>
<tr>
<th>Area</th>
<th>School Average</th>
<th>National Average</th>
<th>Max Possible</th>
<th>Min Acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Skills</td>
<td>16.60 **</td>
<td>10.60</td>
<td>17</td>
<td>12</td>
</tr>
<tr>
<td>Engineering Concepts</td>
<td>18.10</td>
<td>13.75</td>
<td>27</td>
<td>19</td>
</tr>
<tr>
<td>Management Concepts</td>
<td>9.70</td>
<td>8.48</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Materials, Methods, and Plan Reading</td>
<td>22.40</td>
<td>22.75</td>
<td>31</td>
<td>22</td>
</tr>
<tr>
<td>Bidding and Estimating</td>
<td>34.60</td>
<td>35.62</td>
<td>61</td>
<td>36</td>
</tr>
<tr>
<td>Budgeting, Costs, and Cost Control</td>
<td>21.90</td>
<td>21.59</td>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>Planning, Scheduling, and Control</td>
<td>40.00</td>
<td>35.50</td>
<td>48</td>
<td>34</td>
</tr>
<tr>
<td>Construction Safety</td>
<td>16.90</td>
<td>15.99</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>Surveying and Project Layout</td>
<td>3.80 **</td>
<td>4.05</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Project Administration</td>
<td>45.00</td>
<td>39.55</td>
<td>65</td>
<td>33</td>
</tr>
</tbody>
</table>

** Indication area of excellence

Feedback/Action

Significant improvements were made in all but one area. The number of students taking the exam increased from 2 to 10 in one year with 70% passing the exam. The faculty will continue to encourage more students to take the exam.
Graduating Seniors Exit Survey 2010-2011

- **Learning Outcomes**
  - "Contributed a great deal = 1", "Made a considerable contribution = 2", "Made some contribution = 3"
  - Applicable knowledge 1.7
  - Skills required 1.83
  - Critical thinking 1.93
  - Written communication 2.1
  - Verbal communication 1.83
  - Teamwork 1.53
  - Research skills 2.00
  - Computer skills 2.08
  - Diversity experience 2.30
  - Leadership 1.69

**Feedback /Actions**

The faculty needs to continue to improve the written communication skills of the CM students. The faculty will review the Tier II writing course and collaborate on how to improve the written assignments for the 2012-2013 academic year.

SPDC is developing a new student recruiting plan with input from each program. The plan will take advantage of College and University diversity programs. We will recruit in dominantly Hispanic and African American schools and related programs at MSU.

- **Student Identified Strengths**
  - Ability to learn most of the industry both technical and theory based. Great Teachers who care about their students. Small classes were great!
  - Classes are fairly small so it is easy to get one on one time with your professor.
  - Faculty, Curriculum
  - Plenty of Management based classes
  - The core classes are great but CMP students should be allowed to take Calc. based Physics instead of Algebra based physics.
  - The courses focused on commercial construction and how the document management works.
  - The reputation it has with companies. Professor Syal, Professor Mrzowski, Professor Welch, Professor Whitbeck. Internship/job opportunity. Estimating Courses. Class size of about 50 or less. Good size for availability and relationship with professor. Law Course.
  - Scheduling courses.
Feedback/Actions

The faculty continue to do a very good job of integrating the real world into our classroom experiences. We will continue to look for ways to incorporate construction sites on campus into our classroom experience.

- **Student Identified Weakness**
  - Does not have a communication class just for CMP majors, they make you take an interpersonal communications class with 500 students, interpersonal communication does not happen with 500 students.
  - Need to focus a lot more on the working aspects of a construction project. I feel like we have learned everything up to the point at where construction beings, but do not follow everything during and closing projects, which is the majority of the time.
  - P3 is outdated. Computer labs can be insufficient at times.
  - The academic advising for my program is very poor.
  - The advising has been poor, I always accomplished more when I asked faculty members about career opportunities as well as other things.
  - The instructors are great.
  - University or whomever buys computer technology, not providing us with the most up-to-date software that today's employers are using.

Feedback/Actions:

The faculty will explore ways to increase the communication skills of the CM students throughout the curriculum. Changes will be implemented in the 20120-2013 academic year. We will work with the CM Alumni Association to help us purchase new software packages for the 105, 106 and 309 computer labs. The 309 computer lab has been converted to a 24/7 open lab for use by all students.
Employment History

- Fall 2011
  - Average salary $50,933 (n = 6)
  - 87% placed

Feedback /Actions

As an academic unit, we don't have much control of the State’s economy. We have hired a new internship coordinator to develop new industry supported leadership and communication opportunities for our students. We will expand use of our available scholarship funds of $80,000 to attract and retain high quality students during 2011/2012. The program’s career fair attracted 25 firms in 2010 and 30 in 2011.

During 2012-2013 we will develop and coordinate the first workshop on the impact of the construction industry on the state of Michigan. This will be done in partnership with the CM Alumni Association.


1. Based on last year’s concern regarding SIRS evaluations all courses were ranked above average or higher, thus meeting the program and school’s expectations.
2. During the last year we looked at instructor effectiveness as well. It is important that instructors of CM 328, 411, and 423 review their courses with the faculty to identify ways of becoming more effective in the classroom. The instructors of these courses will be asked how they have worked to improve this portion of their course during their annual evaluations.
3. The faculty needs to continue to encourage our CM students to take the AIC/CPC exam.
4. The faculty needs to review the Tier II writing requirements and make sure that we are meeting all of the criteria of a Tier II course to help improve our students written communication skills.
5. The faculty will review the current software being used in the computer labs to determine if we have the most up to date versions. The director will request support of the CM Alumni Association to purchase new software based on this review.
6. The faculty will work with Ms. Rennie to help design and deliver soft skill short courses in interview, leadership, communication and professionalism.
7. The faculty will meet with Dr. Kamden, Professor in the Department of Packaging to determine how we might work with him to use some of his lab space to support our undergraduate lab needs and to expand our research opportunities.