Institutional Effectiveness Achievement Report


Unit Head: Walter Boles
Reports to: College of Basic & Applied Sciences

Mission:
MTSU's mission statement for the construction management program is to provide a broad basic understanding of the construction industry in the areas of commercial, land development/residential building and electrical construction management with the ultimate goal of being able to provide leadership with confidence within the construction industry. Courses are designed to prepare students for middle management leadership roles with a focus on administration, materials, and procedures used in construction. Professional ethics are taught to students while encouraging them to practice maintaining high moral standards and integrity in their daily lives.

Use of Prior Results:
The following changes were made after analysis of 2013-2014 assessment process for each learning outcome in the Electrical Construction Management (ECM) program. The documents are attached under the CURRENT MEASURES AND ANALYSIS OF RESULTS TAB.

Measure 1: Assessment tool: Scores from students Electrical Construction Management (ECM) Capstone presentation to industry. Measure 1 Criteria for Success: The average score from the section of the score sheet relating to this learning outcome for Electrical Construction Management Capstone Presentation should be a minimum of 3.90 using the Likert scale (1 lowest-5 highest score).

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Measure 1: What is the measure? The measure below is continuing to be utilized as it provides the students' assessment of mastery of the learning outcomes. (A new survey was developed for the 2014-2015 year. The criteria for success was also not changed and remains 3.9 on the Likert scale (1 lowest 5 highest). Ongoing methods to improve mastery of learning outcomes are being continued. One on one meetings with individual instructors (especially the Capstone instructor) have been continued as this too seems to improve the presentations and will continue to improve the mastery of the ten learning outcomes. Measure 2: The measure described below, which was started in fall 2013, was left in place as is because it is proving to be a valuable measure to determine program effectiveness. [A new measure was added beginning fall 2013 which addresses the industry leaders response to a request to rank the students readiness for employment in the Electrical Construction Management industry using the Likert scale (5 is most ready and 1 is least ready). Industry assessment of their readiness to hire should represent the students’ level of mastery of the ten learning outcomes of the program]. Measure 3: The measure below is continuing to be utilized as it provides the students assessment of mastery of the learning outcomes. (A new survey was developed for the 2014-2015 year. The criteria for success was also not changed and remains 3.9 on the Likert scale (1 lowest 5 highest). Ongoing methods to improve mastery of learning outcomes are being continued, especially the instructors giving tangible examples of industry expectations of skills which help the students to better understand what industry desires from the program graduates.

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Supporting Document(s):
- CMT ECM SR Learning Outcome Survey 14-15results.docx
- Capstone ECM 4172 Scores 2014-2015.xlsx
- CMT ECM Senior Learning Outcome Survey 2014-2015.xlsx
- ECM Capstone CMT 4172 Score Sheet 2014-2015.xlsx

Future Actions:
Describe Program Changes (adding a course, assignment, project, etc.): We intend to make three changes to the Electrical Construction Management concentration/option. We plan to change our outcomes. The three concentrations/options were developed at different times and have two different directors. This has led
building company which has just become the contractor for a big "X" building job. The company is looking to hire an electrical - mechanical subcontractor. The student is the president of his electrical - mechanical company and is presenting to the contractor's representatives hoping to become the subcontractor for the project. The representatives judge the presentations. The scores represent the student's success in developing an electrical construction plan, presenting the proposal, as well as demonstrating their achievement of the learning outcomes of the Electrical Construction Management concentration. The rubric evaluates the capstone project as a whole and associates skills and characteristics displayed by the students with the learning outcomes of the program. This measure was met as the average of the "total overall scores" was 4.4 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015). Measure 1 Strengths: The students met the criteria for success for this learning outcome. This measure is a broad based assessment tool and used for all learning outcomes for several reasons: 1) The Capstone course is a culmination of all of the ECM courses. 2) The Capstone presentation is presented to industry leaders as well as the MTSU professors. 3) There is a Question and Answer period at the end of the presentation where the judges have an opportunity to ask the student any question they may have about the project and the student must answer the question "on the spot". 4) The scoring rubric has recently been to a lack of cohesiveness within the Construction Management major. A concentrated effort is being made to correct this issue. One of the first steps is to have common outcomes. We plan to make a curriculum change by creating a new class, Construction Fundamentals, CMT 1100. This class will be added to the curriculum beginning Fall 2015. We plan for it to replace Introduction to Operations Management, ET 3910 and Professional Development Seminar, ET 4710. Construction Fundamentals will be an introduction to the major systems encountered when managing construction. This class will include those operations of the residential and commercial construction industry; their similarities, as well as how they differ in scope and daily practice. We plan to add another class, Cost Estimating 1, CMT 3160, to the curriculum. We have had several requests from students for a class in estimating to be added to the curriculum and will
5) The students are given the scoring rubric early in the semester in which they complete their Capstone presentation so they are aware of what the judges are looking for in their presentations and the way the learning outcomes are related to these skills and characteristics.

6) The Capstone presentation is extremely useful in building individual skills and confidence for future formal presentations.

Measure 1: Weakness: The students did meet the criteria for success for this learning outcome. Although the students met the criteria for success by scoring an average of 4.4 on the Likert scale (3.9 was the criteria for success), there were still some areas that indicated weaknesses.

1) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus.

2) Projects completed as assignments in previous classes are not completed with the quality required to be used in the Capstone manual and need improvements.

3) Students are not taking the initiative to schedule either face to face or online meetings with the Capstone course instructor to explore improvements that could be made to the manual and/or presentation before the final presentation.

4) Students are not spending enough time practicing before the actual presentation.

Measure 2: Measure 2 Assessment tool: Industry

Person(s) Responsible: Analysis of Results for Measure 2: (include strengths & weaknesses):
Measure 2 Criteria for Success: The average score for this statement (Please rank the candidate's readiness for employment in the Electrical Construction Management Industry) should be a minimum of 3.0 using the Likert scale (1 lowest-8 highest score).

Measure 2 Results: The Electrical Construction Management (ECM) Capstone presentation to industry is the result of the culmination project for the entire ECM program. Industry leaders and MTSU professors act as judges and score the presentations based on the scoring rubric. The rubric includes this statement, ("Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 as least ready.") This measure was met as the average score was 4.3 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015).

Measure 2 Strengths: As part of the scoring of the Capstone presentation, the judges are asked to rank the candidate's readiness for employment in the Electrical Construction Management Industry (using 5 as most ready and 1 as least ready). We find this measure to be very strong because the learning outcomes are based on what industry feels like the graduating student needs in order to show competency by the time of graduation. If industry ranks the student highly, we feel this is an indication of success in the mastery of the learning outcomes.

Measure 2 Weakness: Industry leaders and MTSU professors score the Capstone manual and presentation. These scores indicate the level of competency in all of the learning outcomes of the program. When the students’ scores indicate they are competent in the learning outcomes, the "readiness for employment scores" are also higher. Although the students met the criteria for success by scoring an average of 4.3 on the
Likert scale (3.9 was the criteria for success), there were still some weaknesses. 1) The students (especially the ones who have completed their classes online) tend to be weaker in the area of formal presentations. They tend to dress less professionally and depend more on their notes during the presentation. 2) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus.

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**Analysis of Results for Measure 3: (include strengths & weaknesses)**

Measure 3 Results: The CMT ECM Senior Learning Outcome Survey is given to graduating seniors along with the CMT ECM Senior Questionnaire. The CMT ECM Senior Learning Outcome Survey asks the students for their opinion of their success in the mastery of the ten learning outcomes of the ECM program. The results from the CMT ECM Senior Learning Outcome Survey showed that 100% were able to answer yes to the question on the survey relating to this learning outcome and the criteria for success was 70%. This outcome was met. The CMT ECM Senior Learning Outcome Survey and results are attached (CMT ECM Senior Learning Outcome Survey 2014-15 and Senior Learning Outcome Results 2014-15).

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### Use of Prior Results

The following changes were made after analysis of 2013-2014 assessment process for each learning outcome in the Electrical Construction Management (ECM) program. The documents are attached under the CURRENT MEASURES AND ANALYSIS OF RESULTS TAB. Measure 1: While the revised 2013-2014 rubric clarified how the items that are scored correlate with the individual learning outcomes, the new 2014-2015 rubric has changes made at the Capstone judges request that are designed to make the scoring process easier for the judges. The rubric is called, ECM Capstone CMT 4172 Score Sheet 2014-2015. The spreadsheet for scores designed for 2013-2014 was not changed for the 2014-2015 year. The criteria for success was also not changed and remains 3.9 on the Likert scale (1 lowest, 5 highest). Ongoing methods to improve mastery of learning outcomes are being continued. One on one meetings with individual instructors (especially the Capstone instructor) have been continued as this too seems to improve the presentations and will continue to improve the mastery of the ten learning outcomes. Measure 2: The measure described below, which was started in fall 2013, was left in place as is because it is proving to be a valuable measure to determine program effectiveness. A new measure was added beginning fall 2013 which addresses the industry leaders response to a request to rank the students' readiness for employment in the Electrical Construction Management industry using the Likert scale (5 is most ready and 1 is least ready). Industry's assessment of their readiness to hire should represent the students' level of mastery of the ten learning outcomes of the program. Measure 3: The measure below is continuing to be utilized as it provides the students assessment of mastery of the learning outcomes. (A new survey was developed for the graduating seniors. It separates the questions about the evaluation of their mastery of the individual learning outcomes from other general questions about the concentration. This survey is called, CMT ECM Senior Learning Outcome Survey. The general questions about the concentration appear in a new document called, CMT ECM Senior Questionnaire for on campus students or CMT ECM Senior Questionnaire for online students). The title of the spreadsheet was designed for compiling the students evaluations of their mastery of the individual learning outcomes has been changed to: ECM Senior Learning Outcome Results 14-15. Ongoing methods to improve mastery of learning outcomes were continued, especially the instructors giving tangible examples of industries' expectations of skills which help the students to better understand what industry desires from the program graduates.

| Student Learning Outcome: Electrical Construction Management students should be able to develop, produce and present a proposal for an electrical construction plan from concept through completion to a board of industry professions. | Measure 1: Measure 1 Assessment tool: Scores from students Electrical Construction Management (ECM) Capstone presentation to industry. Measure 1 Criteria for Success: The average score from the section of the score sheet relating to this learning outcome for Electrical Construction Management Capstone Presentation should be a minimum of 3.90 using the Likert scale (1 lowest, 5 highest score). Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhoek, Dr. Saleh Sbenaty, Dr. Chong Chen Completion Date: 08/24/2015 | Analysis of Results for Measure 1: (include strengths & weaknesses): Measure 1 Results: The Capstone presentation is a compilation of material learned during the entire Electrical Construction Management concentration. The students create a Capstone manual and presentation for industry leaders and professors demonstrating their ability to create an electrical construction plan from concept through completion to a board of industry professionals and MTSU professors. The scenario is that industry leaders and MTSU professors are posed as representatives of a well-known industry." | Supporting Document(s): CMT ECM SR Learning Outcome Survey 14-15results.docx Capstone ECM CMT 4172 Scores 2014-2015.xlsx ECM Capstone CMT 4172 Score Sheet 2014-2015.xlsx CMT ECM Senior Learning Outcome Survey 2014-2015.docx | Future Actions: Describe Program Changes (adding a course, assignment, project, etc.): We intend to make three changes to the Electrical Construction Management concentration/option. We plan to change our outcomes. The three concentrations/options were developed at different times and have two different directors. This has led to a lack of cohesiveness within the concentration/option. |
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Measure 1 Weakness: The students did not meet the criteria for success for this learning outcome. Although the students met the criteria for success by scoring an average of 4.4 on the Likert scale (3.9 was the criteria for success), there were still some areas that indicated weaknesses. 1) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus. 2) Projects completed as assignments in previous classes are not completed with the quality required to be used in the Capstone manual and need improvements. 3) Students are not taking the initiative to schedule either face to face or online meetings with the Capstone course instructor to explore improvements that could be made to the manual and/or presentation before the final presentation. 4) Students are not spending enough time practicing before the actual presentation.

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Person(s) Responsible:  
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4) Students are not spending enough from students for a class in estimating to be added to the curriculum and will add this class in response to their requests.

Future Actions: Describe Assessment Changes (measures such as rubrics, exams, diagnostic instruments, etc.):
We do not plan to make any assessment changes at this time.

Future Actions: Describe any additional resources needed (Leave blank if no additional resources are needed):
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Measure 2 Assessment tool: Industry score for this statement, Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 is the least ready. This statement is included in the ECM Capstone CMT 4172 Score Sheet 2014-2015. Measure 2 Criteria for Success: The average score for this statement (Please rank the candidate's readiness for employment in the Electrical Construction Management Industry) should be a minimum of 3.0 using the Likert scale (1 lowest-5 highest score).

Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

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Measure 3:
Measure 3 Assessment tool: Results from the CMT ECM Senior Learning Outcome Survey given to graduating seniors.
Measure 3 Criteria for Success: Students will answer yes at least 70% of the time to this question, As a graduating construction student do you feel that you have the general knowledge to be able to gather, analyze, synthesize, and apply research to effectively become a productive member of the electrical construction industry?

Person(s) Responsible:
Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Completion Date:
08/24/2015

Analysis of Results for Measure 3: (include strengths & weaknesses)
Measure 3 Results: The CMT ECM Senior Learning Outcome Survey is given to graduating seniors along with the CMT ECM Senior Questionnaire. The CMT ECM Senior Learning Outcome Survey asks the students for their opinion of their success in the mastery of the ten learning outcomes of the ECM program. The results from the CMT ECM Senior Learning Outcome Survey showed that 100% were able to answer yes to the question on the survey relating to this learning outcome and the criteria for success was 70%. This outcome was met. The CMT ECM Senior Learning Outcome Survey and results are attached (CMT ECM Senior Learning Outcome Survey 2014-15 and Senior Learning Outcome Results 2014-15).

Measure 3 Strengths: The students met the criteria for success for this learning outcome with 100% of the
students responding “yes” when asked if they felt that they were able to evaluate and apply knowledge gained in construction methods, materials, codes, specifications, and plan reading to electrical construction projects. This measure is based completely on the students’ perception of their mastery of the individual learning outcomes. Measure 3 Weakness: The students’ opinion of their achievement of this learning outcome tends to be greater than industry leaders’ expectations as provided in the Capstone scores. The students need more guidelines throughout the program with specific illustrations of how industry would perceive success of this learning outcome to have been met.

Use of Prior Results: The following changes were made after analysis of 2013-2014 assessment process for each learning outcome in the Electrical Construction Management (ECM) program. The documents are attached under the CURRENT MEASURES AND ANALYSIS OF RESULTS TAB. Measure 1: While the revised 2013-2014 rubric clarified how the items that are scored correlate with the individual learning outcomes, the new 2014-2015 rubric has changes made at the Capstone judges’ request that are designed to make the scoring process easier for the judges. The rubric is called, ECM Capstone CMT 4172 Score Sheet 2014-2015. The spreadsheet for scores designed for 2013-2014 was not changed for the 2014-2015 year. The criteria for success was also not changed and remains 3.9 on the Likert scale (1 lowest–5 highest). Ongoing methods to improve mastery of learning outcomes are being continued. One on one meetings with individual instructors (especially the Capstone instructor) have been continued as this too seems to improve the presentations and will continue to improve the mastery of the ten learning outcomes. Measure 2: The measure described below, which was started in fall 2013, was left in place as is because it is proving to be a valuable measure to determine program effectiveness. A new measure was added beginning fall 2013 which addresses the industry leaders’ response to a request to rank the students readiness for employment in the Electrical Construction Management industry using the Likert scale (5 is most ready and 1 is least ready). Industry’s assessment of their readiness to hire should represent the students’ level of mastery of the ten learning outcomes of the program. Measure 3: The measure below is continuing to be utilized as it provides the students’ assessment of mastery of the learning outcomes. A new survey was developed for the graduating seniors. It separates the questions about the evaluation of their mastery of the individual learning outcomes from other general questions about the concentration. The title of the spreadsheet was designed for compiling the students’ evaluations of their mastery of the individual learning outcomes has been changed to: ECM Senior Learning Outcome Results 14-15. Ongoing methods to improve mastery of learning outcomes were continued, especially the instructors giving tangible examples of industry’s expectations of skills which help the students to better understand what industry desires from the program graduates.

Student Learning Outcome:
Electrical Construction Management students should be able to estimate and schedule an electrical construction project using information from architectural blueprints.

Measure 1:
Measure 1 Assessment tool: Scores from students Electrical Construction Management (ECM) Capstone presentation to industry. Measure 1 Criteria for Success: The average score from the section of the score sheet relating to this learning outcome for Electrical Construction Management Capstone Presentation should be a minimum of 3.90 using the Likert scale (1 lowest-5 highest score).

Person(s) Responsible:
Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Analysis of Results for Measure 1.
Measure 1 Results: The Capstone presentation is a compilation of material learned during the entire Electrical Construction Management concentration. The students create a Capstone manual and presentation for industry leaders and professors demonstrating their ability to create an electrical

Supporting Document(s):
ECM Capstone CMT 4172 Score Sheet 2014-2015.xlsx
CMT ECM Senior Learning Outcome Survey 2014-2015.xlsx
CMT ECM SR Learning Outcome Survey 14-15.xlsx

Future Actions:
Describe Program Changes (adding a course, assignment, project, etc.): We intend to make three changes to the Electrical Construction Management concentration/option. We plan to change our
construction plan from concept through completion to a board of industry professionals and MTSU professors. The scenario is that industry leaders and MTSU professors are posed as representatives of a well-known building company which has just become the contractor for a big "X" building job. The company is looking to hire an electrical - mechanical subcontractor. The student is the president of this electrical - mechanical company and is presenting to the contractor's representatives hoping to become the subcontractor for the project. The representatives judge the presentations. The scores represent the student's success in developing an electrical construction plan, presenting the proposal, as well as demonstrating their achievement of the learning outcomes of the Electrical Construction Management concentration. The rubric evaluates the Capstone project as a whole and associates skills and characteristics displayed by the students with the learning outcomes of the program. This measure was met as the average of the "total overall scores" was 4.4 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015). Measure 1 Strengths: The students met the criteria for success for this learning outcome. This measure is a broad based assessment tool and used for all learning outcomes for several reasons: 1) The Capstone course is a culmination of all of the ECM courses. 2) The Capstone presentation is presented to industry leaders as well as the MTSU professors. 3) There is a Question outcomes. The three concentrations/options were developed at different times and have two different directors. This has led to a lack of cohesiveness within the Construction Management major. A concentrated effort is being made to correct this issue. One of the first steps is to have common outcomes. We plan to make a curriculum change by creating a new class: Construction Fundamentals, CMT 1100. This class will be added to the curriculum beginning Fall 2015. We plan for it to replace Introduction to Operations Management, ET 3910 and Professional Development Seminar, ET 4710. Construction Fundamentals will be an introduction to the major systems encountered when managing construction. This class will include those operations of the residential and commercial construction industry; their similarities, as well as how they differ in scope and daily practice. We plan to add another class, Cost Estimating 1, CMT 3160, to the
and Answer period at the end of the presentation where the judges have an opportunity to ask the student any question they may have about the project and the student must answer the question "on the spot".  
4) The scoring rubric has recently been redesigned to provide more clarity concerning the learning outcomes' relationships to the skills and characteristics displayed by the students during their presentations.  
5) The students are given the scoring rubric early in the semester in which they complete their Capstone presentation so they are aware of what the judges are looking for in their presentations and the way the learning outcomes are related to these skills and characteristics.  
6) The Capstone presentation is extremely useful in building individual skills and confidence for future formal presentations.  

Measure 1 Weakness: The students did meet the criteria for success for this learning outcome. Although the students met the criteria for success by scoring an average of 4.4 on the Likert scale (3.9 was the criteria for success), there were still some areas that indicated weaknesses.  
1) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus.  
2) Projects completed as assignments in previous classes are not completed with the quality required to be used in the Capstone manual and need improvements.  
3) Students are not taking the initiative to schedule either face to face or online meetings with the Capstone course instructor to explore improvements that could be made to the manual and/or presentation.  

Future Actions: Describe Assessment Changes (measures such as rubrics, exams, diagnostic instruments, etc.): We do not plan to make any assessment changes at this time.  

Future Actions: Describe any additional resources needed (Leave blank if no additional resources are needed):
Measure 2: Measure 2 Assessment tool: Industry score for this statement, Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 is the least ready. This statement is included in the ECM Capstone CMT 4172 Score Sheet 2014-2015. Measure 2 Criteria for Success: The average score for this statement (Please rank the candidate's readiness for employment in the Electrical Construction Management Industry) should be a minimum of 3.0 using the Likert scale (1 lowest-5 highest score).

Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Completion Date: 08/24/2015

Analysis of Results for Measure 2: (include strengths & weaknesses): Measure 2 Results: The Electrical Construction Management (ECM) Capstone presentation to industry is the result of the culmination project for the entire ECM program. Industry leaders and MTSU professors act as judges and score the presentations based on the scoring rubric. The rubric includes this statement, (“Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 as least ready.”) This measure was met as the average score was 4.3 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015). Measure 2 Strengths: As part of the scoring of the Capstone presentation, the judges are asked to rank the candidate's readiness for employment in the Electrical Construction Management Industry (using 5 as most ready and 1 as least ready). We find this measure to be very strong because the learning outcomes are based on what industry feels like the graduating student needs in order to show competency by the time of graduation. If industry ranks the student highly, we feel this is an indication of success in the mastery of the learning outcomes. Measure 2 Weakness: Industry leaders and MTSU professors score the Capstone manual and presentation. These scores indicate the level of
Measure 3:
Measure 3 Assessment tool: Results from the CMT ECM Senior Learning Outcome Survey given to graduating seniors. Measure 3 Criteria for Success: Students will answer yes at least 70% of the time to this question, As a graduating construction student do you feel that you have the general knowledge to be able estimate and schedule an electrical construction project using information from architectural blueprints?

Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Completion Date: 08/24/2015

Analysis of Results for Measure 3: (include strengths & weaknesses)
Measure 3 Results: The CMT ECM Senior Learning Outcome Survey is given to graduating seniors along with the CMT ECM Senior Questionnaire. The CMT ECM Senior Learning Outcome Survey asks the students for their opinion of their success in the mastery of the ten learning outcomes of the ECM program. The results from the CMT ECM Senior Learning Outcome Survey showed that 80% were able to answer yes to the question on the survey relating to this learning outcome and the criteria for success was 70%. This outcome was met. The CMT ECM Senior Learning Outcome Survey and results are attached (CMT ECM Senior Learning Outcome Survey 2014-15 and Senior Learning Outcome Results 2014-15).
Measure 3 Strengths: The students...
met the criteria for success for this learning outcome with 80% of the students responding “yes” when asked if they felt that they were able to evaluate and apply knowledge gained in construction methods, materials, codes, specifications, and plan reading to electrical construction projects. This measure is based completely on the students’ perception of their mastery of the individual learning outcomes. Measure 3 Weakness: The students’ opinion of their achievement of this learning outcome tends to be greater than industry leaders’ expectations as provided in the Capstone scores. The students need more guidelines throughout the program with specific illustrations of how industry would perceive success of this learning outcome to have been met.

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| Student Learning Outcome: Electrical Construction Management students should be able to communicate effectively, clearly, and precisely while conducting electrical construction business as an individual or as part of a team. |
| Measure 1: Measure 1 Assessment tool: Scores from students Electrical Construction Management (ECM) Capstone presentation to industry. Measure 1 Criteria for Success: The average score from the section of the score sheet relating to this learning outcome for Electrical Construction Management Capstone Presentation should | Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen |
| Analysis of Results for Measure 1: (include strengths & weaknesses): Measure 1 Results: The Capstone presentation is a compilation of material learned during the entire Electrical Construction Management concentration. The students create a Capstone manual and presentation for industry leaders and | Supporting Document(s): CMT ECM SR Learning Outcome Survey 14-15results.docx CMT Capstone CMT 4172 Scores 2014-2015.xlsx CMT ECM Capstone CMT 4172 Score Sheet 2014-2015.xlsx CMT ECM Senior Learning Outcome Survey 2014-2015.docx |
| Future Actions: Describe Program Changes (adding a course, assignment, project, etc.): We intend to make three changes to the Electrical Construction Management |
Completion Date: 08/24/2014

professors demonstrating their ability to create an electrical construction plan from concept through completion to a board of industry professionals and MTSU professors. The scenario is that industry leaders and MTSU professors are posed as representatives of a well-known building company which has just become the contractor for a big "X" building subcontract job. The company is looking to hire an electrical - mechanical subcontractor. The student is the president of this electrical - mechanical company and is presenting to the contractor's representatives hoping to become the subcontractor for the project. The representatives judge the presentations. The scores represent the student's success in developing an electrical construction plan, presenting the proposal, as well as demonstrating their achievement of the learning outcomes of the Electrical Construction Management concentration. The rubric evaluates the Capstone project as a whole and associates skills and characteristics displayed by the students with the learning outcomes of the program. This measure was met as the average of the "total overall scores" was 4.4 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015). Measure 1 Strengths: The students met the criteria for success for this learning outcome. This measure is a broad based assessment tool and used for all learning outcomes for several reasons: 1) The Capstone course is a culmination of all of the ECM courses. 2) The Capstone presentation is presented to industry concentration/option. We plan to change our outcomes. The three concentrations/options were developed at different times and have two different directors. This has led to a lack of cohesiveness within the Construction Management major. A concentrated effort is being made to correct this issue. One of the first steps is to have common outcomes. We plan to make a curriculum change by creating a new class, Construction Fundamentals, CMT 1100. This class will be added to the curriculum beginning Fall 2015. We plan for it to replace Introduction to Operations Management, ET 3910 and Professional Development Seminar, ET 4710. Construction Fundamentals will be an introduction to the major systems encountered when managing construction. This class will include those operations of the residential and commercial construction industry; their similarities, as well as how they differ in scope and daily practice. We plan to add another class,
leaders as well as the MTSU professors. 3) There is a Question and Answer period at the end of the presentation where the judges have an opportunity to ask the student any question they may have about the project and the student must answer the question “on the spot”. 4) The scoring rubric has recently been redesigned to provide more clarity concerning the learning outcomes’ relationships to the skills and characteristics displayed by the students during their presentations. 5) The students are given the scoring rubric early in the semester in which they complete their Capstone presentation so they are aware of what the judges are looking for in their presentations and the way the learning outcomes are related to these skills and characteristics. 6) The Capstone presentation is extremely useful in building individual skills and confidence for future formal presentations.

Measure 1
Weakness: The students did meet the criteria for success for this learning outcome. Although the students met the criteria for success by scoring an average of 4.4 on the Likert scale (3.9 was the criteria for success), there were still some areas that indicated weaknesses. 1) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus. 2) Projects completed as assignments in previous classes are not completed with the quality required to be used in the Capstone manual and need improvements. 3) Students are not taking the initiative to schedule either face to face or online meetings with the Capstone course instructor to explore

Future Actions
Describe Assessment Changes (measures such as rubrics, exams, diagnostic instruments, etc.): We do not plan to make any assessment changes at this time.

Future Actions
Describe any additional resources needed (Leave blank if no additional resources are needed):
improvements that could be made to the manual and/or presentation before the final presentation. 4) Students are not spending enough time practicing before the actual presentation.

Measure 2:
Measure 2 Assessment tool: Industry's score for this statement, Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 is the least ready. This statement is included in the ECM Capstone CMT 4172 Score Sheet 2014-2015. Measure 2 Criteria for Success: The average score for this statement (Please rank the candidate's readiness for employment in the Electrical Construction Management Industry) should be a minimum of 3.0 using the Likert scale (1 lowest-5 highest score).

Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen
Completion Date: 08/24/2015

Analysis of Results for Measure 2: (include strengths & weaknesses):
Measure 2 Results: The Electrical Construction Management (ECM) Capstone presentation to industry is the result of the culmination project for the entire ECM program. Industry leaders and MTSU professors act as judges and score the presentations based on the scoring rubric. The rubric includes this statement, (“Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 as least ready.”) This measure was met as the average score was 4.3 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015). Measure 2 Strengths: As part of the scoring of the Capstone presentation, the judges are asked to rank the candidate's readiness for employment in the Electrical Construction Management Industry (using 5 as most ready and 1 as least ready). We find this measure to be very strong because the learning outcomes are based on what industry feels like the graduating student needs in order to show competency by the time of graduation. If industry ranks the student highly, we feel this is an indication of success in the mastery of the learning outcomes. Measure 2 Weakness: Industry leaders and MTSU professors score the
These scores indicate the level of competency in all of the learning outcomes of the program. When the students' scores indicate they are competent in the learning outcomes, the “readiness for employment scores” are also higher. Although the students met the criteria for success by scoring an average of 4.3 on the Likert scale (3.9 was the criteria for success), there were still some weaknesses. 1) The students (especially the ones who have completed their classes online) tend to be weaker in the area of formal presentations. They tend to dress less professionally and depend more on their notes during the presentation, 2) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus.

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Measure 3 Strengths: The students met the criteria for success for this learning outcome with 100% of the students responding “yes” when asked if they felt that they were able to evaluate and apply knowledge gained in construction methods, materials, codes, specifications, and plan reading to electrical construction projects. This measure is based completely on the students’ perception of their mastery of the individual learning outcomes.

Measure 3 Weakness: The students’ opinion of their achievement of this learning outcome tends to be greater than industry leaders’ expectations as provided in the Capstone scores. The students need more guidelines throughout the program with specific illustrations of how industry would perceive success of this learning outcome to have been met.

Use of Prior Results: The following changes were made after analysis of 2013-2014 assessment process for each learning outcome in the Electrical Construction Management (ECM) program. The documents are attached under the CURRENT MEASURES AND ANALYSIS OF RESULTS TAB. Measure 1: While the revised 2013-2014 rubric clarified how the items that are scored correlate with the individual learning outcomes, the new 2014-2015 rubric has changes made at the Capstone judges request that are designed to make the scoring process easier for the judges. The rubric is called, ECM Capstone CMT 4172 Score Sheet 2014-2015. The spreadsheet for scores designed for 2013-2014 was not changed for the 2014-2015 year. The criteria for success was also not changed and remains 3.9 on the Likert scale (1 lowest 5 highest). Ongoing methods to improve mastery of learning outcomes are being continued. One on one meetings with individual instructors (especially the Capstone instructor) have been continued as this too seems to improve the presentations and will continue to improve the mastery of the ten learning outcomes. Measure 2: The measure described below, which was started in fall 2013, was left in place as is because it is proving to be a valuable measure to determine program effectiveness. [A new measure was added beginning fall 2013 which addresses the industry leaders response to a request to rank the student’s readiness for employment in the Electrical Construction Management industry using the Likert scale (5 is most ready and 1 is least ready). Industry’s assessment of their readiness to hire should represent the students’ level of mastery of the ten learning outcomes of the program]. Measure 3: The measure below is continuing to be utilized as it provides the students assessment of mastery of the learning outcomes. (A new survey was developed for the graduating seniors. It separates the questions about the evaluation of their mastery of the individual learning outcomes from other general questions about the concentration. This survey is called, ECM Senior Learning Outcome Survey. The general questions about the concentration appear in a new document called, CMT ECM Senior Questionnaire for on campus students or CMT ECM Senior Questionnaire for online students). The title of the spreadsheet was designed for compiling the students evaluations of their mastery of the individual learning outcomes has been changed to: ECM Senior Learning Outcome Results 14-15. Ongoing methods to improve mastery of learning outcomes were continued, especially the instructors giving tangible examples of industry’s expectations of skills which help the students to better understand what industry desires from the program graduates.

Student Learning Outcome:
Electrical Construction Management students should be able to evaluate, analyze, and synthesize a design business plan using knowledge gained from both technical construction and administrative courses.

Measure 1: Measure 1 Assessment tool: Scores from students Electrical Construction Management (ECM) Capstone presentation to industry. Measure 1 Criteria for Success: The average score from the section of the score sheet relating to this.

Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh

Analysis of Results for Measure 1.(include strengths & weaknesses): Measure 1 Results: The Capstone presentation is a compilation of material learned during the entire Electrical Construction Management.


Future Actions: Describe Program Changes (adding a course, assignment, project, etc.): We intend to make three changes to the
The learning outcome for Electrical Construction Management Capstone Presentation should be a minimum of 3.90 using the Likert scale (1 lowest-5 highest score).

Sbenaty, Dr. Chong Chen

Completion Date: 08/24/2015

The students create a Capstone manual and presentation for industry leaders and professors demonstrating their ability to create an electrical construction plan from concept through completion to a board of industry professionals and MTSU professors. The scenario is that industry leaders and MTSU professors are posed as representatives of a well-known building company which has just become the contractor for a big "X" building job. The company is looking to hire an electrical - mechanical subcontractor. The student is the president of this electrical - mechanical company and is presenting to the contractor's representatives hoping to become the subcontractor for the project. The representatives judge the presentations. The scores represent the student's success in developing an electrical construction plan, presenting the proposal, as well as demonstrating their achievement of the learning outcomes of the Electrical Construction Management concentration. The rubric evaluates the Capstone project as a whole and associates skills and characteristics displayed by the students with the learning outcomes of the program. The measure was met as the average of the "total overall scores" was 4.4 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015).

Measure 1
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Measure 1 Weakness: The students did meet the criteria for success for this learning outcome. Although the students met the criteria for success by scoring an average of 4.4 on the Likert scale (3.9 was the criteria for success), there were still some areas that indicated weaknesses. 1) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus. 2) Projects completed as assignments in previous classes are not completed with the quality required to be used in the Capstone manual and need improvements. 3) Students are not taking the initiative practice. We plan to add another class, Cost Estimating 1, CMT 3160, to the curriculum. We have had several requests from students for a class in estimating to be added to the curriculum and will add this class in response to their requests.

Future Actions: Describe Assessment Changes (measures such as rubrics, exams, diagnostic instruments, etc.): We do not plan to make any assessment changes at this time.

Future Actions: Describe any additional resources needed (Leave blank if no additional resources are needed): 
to schedule either face to face or online meetings with the Capstone course instructor to explore improvements that could be made to the manual and/or presentation before the final presentation. 4) Students are not spending enough time practicing before the actual presentation.

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<td>Measure 3 Results: The CMT ECM Senior Learning Outcome Survey is given to graduating seniors along with the CMT ECM Senior Questionnaire. The CMT ECM Senior Learning Outcome Survey asks the students for their opinion of their success in the mastery of the ten learning outcomes of the ECM program. The results from the CMT ECM Senior Learning Outcome Survey showed that 100% were able to answer yes to the question on the survey relating to this learning outcome and the</td>
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Measure 3 Strengths: The students met the criteria for success for this learning outcome with 100% of the students responding “yes” when asked if they felt that they were able to evaluate and apply knowledge gained in construction methods, materials, codes, specifications, and plan reading to electrical construction projects. This measure is based completely on the students’ perception of their mastery of the individual learning outcomes.

Measure 3 Weakness: The students’ opinion of their achievement of this learning outcome tends to be greater than industry leaders’ expectations as provided in the Capstone scores. The students need more guidelines throughout the program with specific illustrations of how industry would perceive success of this learning outcome to have been met.

Use of Prior Results: The following changes were made after analysis of 2013-2014 assessment process for each learning outcome in the Electrical Construction Management (ECM) program. The documents are attached under the CURRENT MEASURES AND ANALYSIS OF RESULTS TAB. Measure 1: While the revised 2013-2014 rubric clarified how the items that are scored correlate with the individual learning outcomes, the new 2014-2015 rubric has changes made at the Capstone judges request that are designed to make the scoring process easier for the judges. The rubric is called, ECM Capstone CMT 4172 Score Sheet 2014-2015. The spreadsheet for scores designed for 2013-2014 was not changed for the 2014-2015 year. The criteria for success was also not changed and remains 3.9 on the Likert scale (1 lowest 5 highest). Ongoing methods to improve mastery of learning outcomes are being continued. One on one meetings with individual instructors (especially the Capstone instructor) have been continued as this too seems to improve the presentations and will continue to improve the mastery of the ten learning outcomes. Measure 2: The measure described below, which was started in fall 2013, was left in place as is because it is proving to be a valuable measure to determine program effectiveness. [A new measure was added beginning fall 2013 which addresses the industry leaders response to a request to rank the students’ readiness for employment in the Electrical Construction Management industry using the Likert scale (5 is most ready and 1 is least ready). Industry’s assessment of their readiness to hire should represent the students’ level of mastery of the ten learning outcomes of the program]. Measure 3: The measure below is continuing to be utilized as it provides the students assessment of mastery of the learning outcomes. (A new survey was developed for the graduating seniors. It separates the questions about the evaluation of their mastery of the individual learning outcomes from other general questions about the concentration. This survey is called, ECM Senior Learning Outcome Survey. The general questions about the concentration appear in a new document called, CMT ECM Senior Questionnaire for on campus students or CMT ECM Senior Questionnaire for online students). The title of the spreadsheet was designed for compiling the students evaluations of their mastery of the individual learning outcomes has been changed to: ECM Senior Learning Outcome Results 14-15. Ongoing methods to improve mastery of learning outcomes were continued, especially the instructors giving tangible examples of industry’s expectations of skills which help the students to better understand what industry desires from the program graduates.
Electrical Construction Management students should be able to identify and solve problems using construction estimating and project management software programs; CAD software, Microsoft Word, Excel, and PowerPoint.

Measure 1 Assessment tool: Scores from Electrical Construction Management (ECM) Capstone presentation to industry. Measure 1 Criteria for Success: The average score from the section of the score sheet relating to this learning outcome for Electrical Construction Management Capstone Presentation should be a minimum of 3.90 using the Likert scale (1 lowest-5 highest score).

Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen
Completion Date: 08/24/2015

(include strengths & weaknesses):

1 Result: The Capstone presentation is a compilation of material learned during the entire Electrical Construction Management concentration. The students create a Capstone manual and presentation for industry leaders and professors demonstrating their ability to create an electrical construction plan from concept through completion to a board of industry professionals and MTSU professors. The scenario is that industry leaders and MTSU professors are posed as representatives of a well-known building company which has just become the contractor for a big "X" building job. The company is looking to hire an electrical - mechanical subcontractor. The student is the president of this electrical - mechanical company and is presenting to the contractor's representatives hoping to become the subcontractor for the project. The representatives judge the presentations. The scores represent the student’s success in developing an electrical construction plan, presenting the proposal, as well as demonstrating their achievement of the learning outcomes of the Electrical Construction Management concentration. The rubric evaluates the Capstone project as a whole and associates skills and characteristics displayed by the students with the learning outcomes of the program. This measure was met as the average of the “total overall scores” was 4.4 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015.xlsx).

Measure 1 Strengths: The students met the criteria for

Measure 1 Results: The Capstone CMT 4172 Score Sheet 2014-2015.xlsx
Capstone CMT 4172 Scores 2014-2015.xlsx
CMT ECM SR Learning Outcome Survey 14-15results.docx
CMT ECM Senior Learning Outcome Survey 2014-2015.docx

Measure 1 Strengths: The students met the criteria for

Measure 1 Strengths: The students met the criteria for

Measure 1 Results: The Capstone CMT 4172 Score Sheet 2014-2015.xlsx
Capstone CMT 4172 Scores 2014-2015.xlsx
CMT ECM SR Learning Outcome Survey 14-15results.docx
CMT ECM Senior Learning Outcome Survey 2014-2015.docx

Measure 1 Results: The Capstone CMT 4172 Score Sheet 2014-2015.xlsx
Capstone CMT 4172 Scores 2014-2015.xlsx
CMT ECM SR Learning Outcome Survey 14-15results.docx
CMT ECM Senior Learning Outcome Survey 2014-2015.docx

Describe Program Changes (adding a course, assignment, project, etc.): We intend to make three changes to the Electrical Construction Management concentration/option. We plan to change our outcomes. The three concentrations/options were developed at different times and have two different directors. This has led to a lack of cohesiveness within the Construction Management major. A concentrated effort is being made to correct this issue. One of the first steps is to have common outcomes. We plan to make a curriculum change by creating a new class. Construction Fundamentals, CMT 1100. This class will be added to the curriculum beginning Fall 2015. We plan for it to replace Introduction to Operations Management, ET 3910 and Professional Development Seminar, ET 4710. Construction Fundamentals will be an introduction to the major systems encountered when managing construction. This class will include those operations of
success for this learning outcome. This measure is a broad based assessment tool and used for all learning outcomes for several reasons: 1) The Capstone course is a culmination of all of the ECM courses. 2) The Capstone presentation is presented to industry leaders as well as the MTSU professors. 3) There is a Question and Answer period at the end of the presentation where the judges have an opportunity to ask the student any question they may have about the project and the student must answer the question “on the spot”. 4) The scoring rubric has recently been redesigned to provide more clarity concerning the learning outcomes’ relationships to the skills and characteristics displayed by the students during their presentations. 5) The students are given the scoring rubric early in the semester in which they complete their Capstone presentation so they are aware of what the judges are looking for in their presentations and the way the learning outcomes are related to these skills and characteristics. 6) The Capstone presentation is extremely useful in building individual skills and confidence for future formal presentations. Measure 1 Weakness: The students did meet the criteria for success for this learning outcome. Although the students met the criteria for success by scoring an average of 4.4 on the Likert scale (3.9 was the criteria for success), there were still some areas that indicated weaknesses. 1) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus. 2) Projects completed as the residential and commercial construction industry; their similarities, as well as how they differ in scope and daily practice. We plan to add another class, Cost Estimating 1, CMT 3160, to the curriculum. We have had several requests from students for a class in estimating to be added to the curriculum and will add this class in response to their requests.

Future Actions: Describe Assessment Changes (measures such as rubrics, exams, diagnostic instruments, etc.): We do not plan to make any assessment changes at this time.

Future Actions: Describe any additional resources needed (Leave blank if no additional resources are needed):
Measure 2:
Measure 2 Assessment tool: Industry's score for this statement, Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 is the least ready. This statement is included in the ECM Capstone CMT 4172 Score Sheet 2014-2015. Measure 2 Criteria for Success: The average score for this statement (Please rank the candidate's readiness for employment in the Electrical Construction Management Industry) should be a minimum of 3.0 using the Likert scale (1 lowest-5 highest score).

Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Completion Date: 08/24/2015

Analysis of Results for Measure 2:
Analysis includes strengths & weaknesses: Measure 2 Results: The Electrical Construction Management (ECM) Capstone presentation to industry is the result of the culmination project for the entire ECM program. Industry leaders and MTSU professors act as judges and score the presentations based on the scoring rubric. The rubric includes this statement, (“Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 as least ready.”) This measure was met as the average score was 4.3 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015). Measure 2 Strengths: As part of the scoring of the Capstone presentation, the judges are asked to rank the candidate’s readiness for employment in the Electrical Construction Management Industry (using 5 as most ready and 1 as least ready). We find this measure to be very strong because the learning outcomes are based on what industry feels like the
Measure 3:  
Measure 3 Assessment tool: Results from the CMT ECM Senior Learning Outcome Survey given to graduating seniors. 
Measure 3 Criteria for Success: Students will answer yes at least 70% of the time to this question, As a graduating construction student do you feel that you have the general knowledge to be able to identify and solve problems using construction estimating and project management software programs; CAD software; Microsoft Word; Excel; and PowerPoint?.

Person(s) Responsible:  
Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Completion Date:  
08/24/2015

Analysis of Results for Measure 3: (include strengths & weaknesses) 
Measure 3 Results: The CMT ECM Senior Learning Outcome Survey is given to graduating seniors along with the CMT ECM Senior Questionnaire. The CMT ECM Senior Learning Outcome Survey asks the students for their opinion of their success in the mastery of the ten learning outcomes of the ECM program. The results from the CMT ECM Senior Learning Outcome Survey showed that 100% were able to answer yes to the
question on the survey relating to this learning outcome and the criteria for success was 70%. This outcome was met. The CMT ECM Senior Learning Outcome Survey and results are attached (CMT ECM Senior Learning Outcome Survey 2014-15 and Senior Learning Outcome Results 2014-15).

Measure 3 Strengths: The students met the criteria for success for this learning outcome with 100% of the students responding “yes” when asked if they felt that they were able to evaluate and apply knowledge gained in construction methods, materials, codes, specifications, and plan reading to electrical construction projects. This measure is based completely on the students’ perception of their mastery of the individual learning outcomes.

Measure 3 Weakness: The students’ opinion of their achievement of this learning outcome tends to be greater than industry leaders’ expectations as provided in the Capstone scores. The students need more guidelines throughout the program with specific illustrations of how industry would perceive success of this learning outcome to have been met.

Use of Prior Results: The following changes were made after analysis of 2013-2014 assessment process for each learning outcome in the Electrical Construction Management (ECM) program. The documents are attached under the CURRENT MEASURES AND ANALYSIS OF RESULTS TAB. Measure 1: While the revised 2013-2014 rubric clarified how the items that are scored correlate with the individual learning outcomes, the new 2014-2015 rubric has changes made at the Capstone judges request that are designed to make the scoring process easier for the judges. The rubric is called, ECM Capstone CMT 4172 Score Sheet 2014-2015. The spreadsheet for scores designed for 2013-2014 was not changed for the 2014-2015 year. The criteria for success was also not changed and remains 3.9 on the Likert scale (1 lowest 5 highest). Ongoing methods to improve mastery of learning outcomes are being continued. One on one meetings with individual instructors (especially the Capstone instructor) have been continued as this too seems to improve the presentations and will continue to improve the mastery of the ten learning outcomes.

Measure 2: The measure described below, which was started in fall 2013, was left in place as is because it is proving to be a valuable measure to determine program effectiveness. [A new measure was added beginning fall 2013 which addresses the industry leaders response to a request to rank the students readiness for employment in the Electrical Construction Management industry using the Likert scale (5 is most ready and 1 is least ready). Industry assessment of their readiness to hire should represent the students level of mastery of the ten learning outcomes of the program]. Measure 3: The measure below is continuing to be utilized as it provides the students assessment of mastery of the learning outcomes. [A new survey was developed for the graduating seniors. It separates the questions about the evaluation of their mastery of the individual learning outcomes from other general questions about the concentration. This survey is called, CMT ECM Senior Learning Outcome Survey. The general questions about the concentration appear in a new document called, CMT ECM Senior Questionnaire for on campus students or CMT ECM Senior Questionnaire for online students). The title of the spreadsheet was designed for compiling the students evaluations of their mastery of the individual learning outcomes has been changed to: ECM Senior Learning Outcome Results 14-15.

Ongoing methods to improve mastery of learning outcomes were continued, especially the instructors giving tangible examples of industries expectations of skills which help the students to better understand what industry desires from the program graduates.
Student Learning Outcome:
Electrical Construction Management students should be able to understand the ethical, professional, and social responsibilities of an electrical construction professional.

Measure 1:
Measure 1 Assessment tool: Scores from students Electrical Construction Management (ECM) Capstone presentation to industry. Measure 1 Criteria for Success: The average score from the section of the score sheet relating to this learning outcome for Electrical Construction Management Capstone Presentation should be a minimum of 3.90 using the Likert scale (1 lowest-5 highest score).

Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Completion Date: 08/24/2015

Analysis of Results for Measure 1 (include strengths & weaknesses):
Measure 1 Results: The Capstone presentation is a compilation of material learned during the entire Electrical Construction Management concentration. The students create a Capstone manual and presentation for industry leaders and professors demonstrating their ability to create an electrical construction plan from concept through completion to a board of industry professionals and MTSU professors. The scenario is that industry leaders and MTSU professors are posed as representatives of a well-known building company which has just become the contractor for a big "X" building job. The company is looking to hire an electrical - mechanical subcontractor. The student is the president of this electrical - mechanical company and is presenting to the contractor's representatives hoping to become the subcontractor for the project. The representatives judge the presentations. The scores represent the student's success in developing an electrical construction plan, presenting the proposal, as well as demonstrating their achievement of the learning outcomes of the Electrical Construction Management concentration. The rubric evaluates the Capstone project as a whole and associates skills and characteristics displayed by the students with the learning outcomes of the program. This measure was met as the average of the "total overall scores" was 4.4 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet)

Supporting Document(s):
CMT ECM SR Learning Outcome Survey 14-15 results.docx
Capstone CMT 4172 Scores 2014-2015.xlsx
ECM Capstone CMT 4172 Score Sheet 2014-2015.xlsx
CMT ECM Senior Learning Outcome Survey 2014-2015.docx

Future Actions:
Describe Program Changes (adding a course, assignment, project, etc.):
We intend to make three changes to the Electrical Construction Management concentration/option. We plan to change our outcomes. The three concentrations/options were developed at different times and have two different directors. This has led to a lack of cohesiveness within the Construction Management major. A concentrated effort is being made to correct this issue. One of the first steps is to have common outcomes. We plan to make a curriculum change by creating a new class. Construction Fundamentals, CMT 1100. This class will be added to the curriculum beginning Fall 2015. We plan for it to replace Introduction to Operations Management, ET 3910 and Professional Development Seminar, ET 4710. Construction Fundamentals will be an introduction to the major systems encountered when managing construction. This
Strengths: The students met the criteria for success for this learning
outcome. This measure is a broad based assessment tool and used
for all learning outcomes for several reasons: 1) The Capstone course is
culmination of all of the ECM courses. 2) The Capstone
presentation is presented to industry leaders as well as the
MTSU professors. 3) There is a Question and Answer period at the
end of the presentation where the judges have an opportunity to ask
the student any question they may have about the project and the
student must answer the question "on the spot". 4) The scoring rubric
has recently been redesigned to provide more clarity concerning the
learning outcomes’ relationships to the skills and characteristics
displayed by the students during their presentations. 5) The students
are given the scoring rubric early in the semester in which they
complete their Capstone presentation so they are aware of what the judges are looking for in their presentations and the way the learning outcomes are related to these skills and characteristics. 6) The Capstone presentation is extremely useful in building individual skills and confidence for future formal presentations.

Measure 1 Weakness: The students did meet the criteria for success for this learning outcome. Although the students met the criteria for success by scoring an average of 4.4 on the Likert scale (3.9 was the criteria for success), there were still some areas that indicated weaknesses. 1) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more

Future Actions:
Describe Assessment Changes (measures such as rubrics, exams, diagnostic instruments, etc.):
We do not plan to make any assessment changes at this time.

Future Actions:
Describe any additional resources needed (Leave blank if no additional resources are needed):
4) Students are not spending enough time practicing before the actual presentation.

Measure 2:  
Measure 2 Assessment tool: Industry score for this statement, Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 is the least ready. This statement is included in the ECM Capstone CMT 4172 Score Sheet 2014-2015. Measure 2 Criteria for Success: The average score for this statement (Please rank the candidate's readiness for employment in the Electrical Construction Management Industry) should be a minimum of 3.0 using the Likert scale (1 lowest-5 highest score).

Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Completion Date: 08/24/2015

Analysis of Results for Measure 2: (include strengths & weaknesses):
Measure 2 Results: The Electrical Construction Management (ECM) Capstone presentation to industry is the result of the culmination project for the entire ECM program. Industry leaders and MTSU professors act as judges and score the presentations based on the scoring rubric. The rubric includes this statement, ("Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 as least ready."). This measure was met as the average score was 4.3 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015). Measure 2 Strengths: As part of the scoring of the Capstone presentation, the judges are asked to rank the candidate's readiness for employment in the Electrical Construction Management Industry (using 5 as most ready and 1 as
We find this measure to be very strong because the learning outcomes are based on what industry feels like the graduating student needs in order to show competency by the time of graduation. If industry ranks the student highly, we feel this is an indication of success in the mastery of the learning outcomes.

Measure 2
Weakness: Industry leaders and MTSU professors score the Capstone manual and presentation. These scores indicate the level of competency in all of the learning outcomes of the program. When the students’ scores indicate they are competent in the learning outcomes, the “readiness for employment scores” are also higher. Although the students met the criteria for success by scoring an average of 4.3 on the Likert scale (3.9 was the criteria for success), there were still some weaknesses. 1) The students (especially the ones who have completed their classes online) tend to be weaker in the area of formal presentations. They tend to dress less professionally and depend more on their notes during the presentation. 2) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus.

Measure 3:
Assessment tool: Results from the CMT ECM Senior Learning Outcome Survey given to graduating seniors.
Criteria for Success: Students will answer yes at least 70% of the time to this question, As a graduating construction student do you feel that you have the general knowledge to be able to understand the ethical, professional, and social

Person(s) Responsible:
Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Analysis of Results for Measure 3: (include strengths & weaknesses)
Measure 3 Results: The CMT ECM Senior Learning Outcome Survey is given to graduating seniors along with the CMT ECM Senior Questionnaire. The CMT ECM Senior Learning Outcome Survey asks the students for their opinion...
responsible of an electrical construction professional? 

**Completion Date:** 05/31/2015

The results from the CMT ECM Senior Learning Outcome Survey showed that 100% were able to answer yes to the question on the survey relating to this learning outcome and the criteria for success was 70%. This outcome was met. The CMT ECM Senior Learning Outcome Survey and results are attached (CMT ECM Senior Learning Outcome Survey 2014-15 and Senior Learning Outcome Results 2014-15).

**Measure 3 Strengths:** The students met the criteria for success for this learning outcome with 100% of the students responding "yes" when asked if they felt that they were able to evaluate and apply knowledge gained in construction methods, materials, codes, specifications, and plan reading to electrical construction projects. This measure is based completely on the students' perception of their mastery of the individual learning outcomes.

**Measure 3 Weakness:** The students' opinion of their achievement of this learning outcome tends to be greater than industry leaders' expectations as provided in the Capstone scores. The students need more guidelines throughout the program with specific illustrations of how industry would perceive success of this learning outcome to have been met.

**Use of Prior Results:** The following changes were made after analysis of 2013-2014 assessment process for each learning outcome in the Electrical Construction Management (ECM) program. The documents are attached under the CURRENT MEASURES AND ANALYSIS OF RESULTS TAB. Measure 1: While the revised 2013-2014 rubric clarified how the items that are scored correlate with the individual learning outcomes, the new 2014-2015 rubric has changes made at the Capstone judges request that are designed to make the scoring process easier for the judges. The rubric is called, ECM Capstone CMT 4172 Score Sheet 2014-2015. The spreadsheet for scores designed for 2013-2014 was not changed for the 2014-2015 year. The criteria for success was also not changed and remains 3.9 on the Likert scale (1 lowest 5 highest). Ongoing methods to improve mastery of learning outcomes are being continued. One on one meetings with individual instructors (especially the Capstone instructor) have been continued as this too seems to improve the presentations and will continue to improve the mastery of the ten learning outcomes. Measure 2: The measure described below, which was started in fall 2013, was left in place as is because it is proving to be a valuable measure to determine program effectiveness. [A new measure was added beginning fall 2013 which addresses the industry leaders response to a request to rank the students readiness for employment in the Electrical Construction Management industry using the Likert scale (5 is most ready and 1 is least ready). Industry's assessment of their readiness to hire should represent the students level of mastery of the ten
Learning outcomes of the program. Measure 3: The measure below is continuing to be utilized as it provides the students assessment of mastery of the learning outcomes. (A new survey was developed for the graduating seniors. It separates the questions about the evaluation of their individual learning outcomes from other general questions about the concentration. This survey is called, CMT ECM Senior Learning Outcome Survey. The general questions about the concentration appear in a new document called, CMT ECM Senior Questionnaire for on campus students or CMT ECM Senior Questionnaire for online students). The title of the spreadsheet was designed for compiling the students evaluations of their mastery of the individual learning outcomes has been changed to: ECM Senior Learning Outcome Results 14-15. Ongoing methods to improve mastery of learning outcomes were continued, especially the instructors giving tangible examples of industries expectations of skills which help the students to better understand what industry desires from the program graduates.

Student Learning Outcome:
Electrical Construction Management
students should be able to use teamwork and leadership skills to seek and share knowledge and perform creatively and effectively.

Measure 1:
Measure 1 Assessment tool: Scores from students Electrical Construction Management (ECM) Capstone presentation to industry. Measure 1 Criteria for Success: The average score from the section of the score sheet relating to this learning outcome for Electrical Construction Management Capstone Presentation should be a minimum of 3.90 using the Likert scale (1 lowest - 5 highest score).

Person(s) Responsible:
Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen
Completion Date:
08/24/2015

Analysis of Results for Measure 1:
Measure 1 Results: The Capstone presentation is a compilation of material learned during the entire Electrical Construction Management concentration. The students create a Capstone manual and presentation for industry leaders and professors demonstrating their ability to create an electrical construction plan from concept through completion to a board of industry professionals and MTSU professors. The scenario is that industry leaders and MTSU professors are posed as representatives of a well-known building company which has just become the contractor for a big "X" building job. The company is looking to hire an electrical - mechanical subcontractor. The student is the president of this electrical - mechanical company and is presenting to the contractor's representatives hoping to become the subcontractor for the project. The representatives judge the presentations. The scores represent the student's success in developing an electrical construction plan, presenting the proposal, as well as demonstrating their achievement of the learning outcomes of the Electrical Construction Management concentration. The rubric evaluates the Capstone project as a whole and associates skills and characteristics displayed by the students with the learning outcomes of the program. This measure was met as the

Supporting Document(s):
CMT ECM SR Learning Outcome Survey 14-15results.docx
Capstone ECM 4172 Scores 2014-2015.xlsx
ECM Capstone ECM 4172 Score Sheet 2014-2015.xlsx
CMT ECM Senior Learning Outcome Survey 2014-2015.docx

Future Actions:
Describe Program Changes (adding a course, assignment, project, etc.):
We intend to make three changes to the Electrical Construction Management concentration/option. We plan to change our outcomes. The three concentrations/options were developed at different times and have two different directors. This has led to a lack of cohesiveness within the Construction Management major. A concentrated effort is being made to correct this issue. One of the first steps is to have common outcomes. We plan to make a curriculum change by creating a new class. Construction Fundamentals, CMT 1100. This class will be added to the curriculum beginning Fall 2015. We plan for it to replace Introduction to Operations Management, ET 3910 and Professional Development Seminar, ET 4710.
The average of the "total overall scores" was 4.4 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015). Measure 1 Strengths: The students met the criteria for success for this learning outcome. This measure is a broad based assessment tool and used for all learning outcomes for several reasons: 1) The Capstone course is a culmination of all of the ECM courses. 2) The Capstone presentation is presented to industry leaders as well as the MTSU professors. 3) There is a Question and Answer period at the end of the presentation where the judges have an opportunity to ask the student any question they may have about the project and the student must answer the question "on the spot". 4) The scoring rubric has recently been redesigned to provide more clarity concerning the learning outcomes’ relationships to the skills and characteristics displayed by the students during their presentations. 5) The students are given the scoring rubric early in the semester in which they complete their Capstone presentation so they are aware of what the judges are looking for in their presentations and the way the learning outcomes are related to these skills and characteristics. 6) The Capstone presentation is extremely useful in building individual skills and confidence for future formal presentations. Measure 1 Weakness: The students did meet the criteria for success for this learning outcome. Although the students met the criteria for success by scoring an average of 4.4 on the Likert scale (3.9 was the
Measure 2: Assessment tool: Industry's score for this statement, Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 is the least ready. This statement is included in the ECM Capstone CMT 4172 Score Sheet 2014-2015. Measure 2 Criteria for Success: The average score for this statement (Please rank the candidate's readiness for employment in the Electrical Construction Management Industry) should be a minimum of 3.0 using the Likert scale (1 lowest-5 highest score).

Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Completion Date: 08/24/2015

Analysis of Results for Measure 2: (include strengths & weaknesses):
Measure 2 Results: The Electrical Construction Management (ECM) Capstone presentation to industry is the result of the culmination project for the entire ECM program. Industry leaders and MTSU professors act as judges and score the presentations based on the scoring rubric. This measure was met as the average score was 4.3 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015).

Strengths: As part of the scoring of the Capstone presentation, the
judges are asked to rank the candidate's readiness for employment in the Electrical Construction Management Industry (using 5 as most ready and 1 as least ready). We find this measure to be very strong because the learning outcomes are based on what industry feels like the graduating student needs in order to show competency by the time of graduation. If industry ranks the student highly, we feel this is an indication of success in the mastery of the learning outcomes. Measure 2 Weakness: Industry leaders and MTSU professors score the Capstone manual and presentation. These scores indicate the level of competency in all of the learning outcomes of the program. When the students’ scores indicate they are competent in the learning outcomes, the “readiness for employment scores” are also higher. Although the students met the criteria for success by scoring an average of 4.3 on the Likert scale (3.9 was the criteria for success), there were still some weaknesses. 1) The students (especially the ones who have completed their classes online) tend to be weaker in the area of formal presentations. They tend to dress less professionally and depend more on their notes during the presentation, 2) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus.

| Measure 3: | Person(s) Responsible: Dr. David Hatfield, Mr. Duane Vanhook, Dr. |
| Measure 3 Assessment tool: Results from the CMT ECM Senior Learning Outcome Survey given to graduating seniors. Measure 3 Criteria for Success: Students will answer yes at least 70% of the time | Analysis of Results for Measure 3: (include strengths & weaknesses) Measure 3 Results: The CMT ECM Senior Learning Outcome Survey is given to graduating seniors along with the CMT ECM Senior |
this question, As a graduating construction student do you feel that you have the general knowledge to be able to use teamwork and leadership skills to seek and share knowledge and perform creatively and effectively?

Saleh Sbenaty, Dr. Chong Chen

Completion Date: 08/24/2015

Questionnaire. The CMT ECM Senior Learning Outcome Survey asks the students for their opinion of their success in the mastery of the ten learning outcomes of the ECM program. The results from the CMT ECM Senior Learning Outcome Survey showed that 100% were able to answer yes to the question on the survey relating to this learning outcome and the criteria for success was 70%. This outcome was met. The CMT ECM Senior Learning Outcome Survey and results are attached (CMT ECM Senior Learning Outcome Survey 2014-15 and Senior Learning Outcome Results 2014-15).

Measure 3: Strengths: The students met the criteria for success for this learning outcome with 100% of the students responding “yes” when asked if they felt that they were able to evaluate and apply knowledge gained in construction methods, materials, codes, specifications, and plan reading to electrical construction projects. This measure is based completely on the students’ perception of their mastery of the individual learning outcomes. Measure 3 Weakness: The students’ opinion of their achievement of this learning outcome tends to be greater than industry leaders’ expectations as provided in the Capstone scores. The students need more guidelines throughout the program with specific illustrations of how industry would perceive success of this learning outcome to have been met.

Use of Prior Results: The following changes were made after analysis of 2013-2014 assessment process for each learning outcome in the Electrical Construction Management (ECM) program. The documents are attached under the CURRENT MEASURES AND ANALYSIS OF RESULTS TAB. Measure 1: While the revised 2013-2014 rubric clarified how the items that are scored correlate with the individual learning outcomes, the new 2014-2015 rubric has changes made at the Capstone judges’ request that are designed to make the scoring process easier for the judges. The rubric is called, ECM Capstone CMT 4172 Score Sheet 2014-2015 The spreadsheet for scores designed for 2013-2014 was not changed for the 2014-2015 year. The criteria for success was also not changed and remains 3.9 on the Likert scale (1 lowest 5 highest). Ongoing
methods to improve mastery of learning outcomes are being continued. One on one meetings with individual instructors (especially the Capstone instructor) have been continued as this too seems to improve the presentations and will continue to improve the mastery of the ten learning outcomes. Measure 2: The measure described below, which was started in fall 2013, was left in place as is because it is proving to be a valuable measure to determine program effectiveness. [A new measure was added beginning fall 2013 which addresses the industry leaders response to a request to rank the students level of mastery of the ten learning outcomes of the program]. Measure 3: The measure below is continuing to be utilized as it provides the students assessment of mastery of the learning outcomes. (A new survey was developed for the graduating seniors. It separates the questions about the evaluation of their mastery of the individual learning outcomes from other general questions about the concentration. This survey is called, CMT ECM Senior Learning Outcome Survey. The general questions about the concentration appear in a new document called, CMT ECM Senior Questionnaire for on campus students or CMT ECM Senior Questionnaire for online students). The title of the spreadsheet was designed for compiling the students evaluations of their mastery of the individual learning outcomes has been changed to: ECM Senior Learning Outcome Results 14-15. Ongoing methods to improve mastery of learning outcomes were continued, especially the instructors giving tangible examples of industry’s expectations of skills which help the students to better understand what industry desires from the program graduates.

<table>
<thead>
<tr>
<th>Student Learning Outcome:</th>
<th>Electrical Construction Management students should be able to visualize the final product before the conceptual plan is developed.</th>
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<tbody>
<tr>
<td>Measure 1:</td>
<td>Measure 1 Assessment tool: Scores from students Electrical Construction Management (ECM) Capstone presentation to industry. Measure 1 Criteria for Success: The average score from the section of the score sheet relating to this learning outcome for Electrical Construction Management Capstone Presentation should be a minimum of 3.90 using the Likert scale (1 lowest-5 highest score).</td>
</tr>
<tr>
<td>Person(s) Responsible:</td>
<td>Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen</td>
</tr>
<tr>
<td>Completion Date:</td>
<td>08/24/2015</td>
</tr>
</tbody>
</table>

| Analysis of Results for Measure 1: (include strengths & weaknesses): | Measure 1 Results: The Capstone presentation is a compilation of material learned during the entire Electrical Construction Management concentration. The students create a Capstone manual and presentation for industry leaders and professors demonstrating their ability to create an electrical construction plan from concept through completion to a board of industry professionals and MTSU professors. The scenario is that industry leaders and MTSU professors are posed as representatives of a well-known building company which has just become the contractor for a big "X" building job. The company is looking to hire an electrical - mechanical subcontractor. The student is the president of his electrical - mechanical company and is presenting to the contractor's representatives hoping to become the subcontractor for the project. The representatives judge the presentations. The scores represent the student’s success in developing an electrical construction plan, presenting the proposal, as well as demonstrating their achievement of the learning outcomes of the Electrical Construction Management concentration. The rubric evaluates the Capstone project as a whole and associates skills and characteristics |

<table>
<thead>
<tr>
<th>Supporting Document(s):</th>
<th>CMT ECM SR Learning Outcome Survey 14-15results.docx</th>
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<tr>
<th>Supporting Document(s):</th>
<th>Capstone ECM 4172 Scores 2014-2015.xlsx</th>
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<tbody>
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<td>Supporting Document(s):</td>
<td>ECM Capstone ECM 4172 Score Sheet 2014-2015.xlsx</td>
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</tbody>
</table>

| Future Actions: | Describe Program Changes (adding a course, assignment, project, etc.): We intend to make three changes to the Electrical Construction Management concentration/option. We plan to change our outcomes. The three concentrations/options were developed at different times and have two different directors. This has led to a lack of cohesiveness within the Construction Management major. A concentrated effort is being made to correct this issue. One of the first steps is to have common outcomes. We plan to make a curriculum change by creating a new class. Construction Fundamentals, CMT 1100. This class will be added to the curriculum beginning Fall 2015. We plan for it to replace Introduction to Operations |

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**Future Actions:**

- **Describe Program Changes (adding a course, assignment, project, etc.):**
  - We intend to make three changes to the Electrical Construction Management concentration/option.
  - We plan to change our outcomes. The three concentrations/options were developed at different times and have two different directors. This has led to a lack of cohesiveness within the Construction Management major. A concentrated effort is being made to correct this issue. One of the first steps is to have common outcomes.
  - We plan to make a curriculum change by creating a new class. Construction Fundamentals, CMT 1100. This class will be added to the curriculum beginning Fall 2015. We plan for it to replace Introduction to Operations.
displayed by the students with the learning outcomes of the program. This measure was met as the average of the "total overall scores" was 4.4 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015). Measure 1 Strengths: The students met the criteria for success for this learning outcome. This measure is a broad-based assessment tool and used for all learning outcomes for several reasons: 1) The Capstone course is a culmination of all of the ECM courses. 2) The Capstone presentation is presented to industry leaders as well as the MTSU professors. 3) There is a Question and Answer period at the end of the presentation where the judges have an opportunity to ask the student any question they may have about the project and the student must answer the question "on the spot". 4) The scoring rubric has recently been redesigned to provide more clarity concerning the learning outcomes' relationships to the skills and characteristics displayed by the students during their presentations. 5) The students are given the scoring rubric early in the semester in which they complete their Capstone presentation so they are aware of what the judges are looking for in their presentations and the way the learning outcomes are related to these skills and characteristics. 6) The Capstone presentation is extremely useful in building individual skills and confidence for future formal presentations. Measure 1 Weakness: The students did meet the criteria for success for this learning outcome. Although the
Measure 2:
Measure 2 Assessment tool: Industry score for this statement, Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 is the least ready. This statement is included in the ECM Capstone CMT 4172 Score Sheet 2014-2015. Measure 2 Criteria for Success: The average score for this statement (Please rank the candidate's readiness for employment in the Electrical Construction Management Industry) should be a minimum of 3.0 using the Likert scale (1 lowest-5 highest score).

Person(s)
Responsible:
Dr. David Hatfield, Mr. Duane Vanhook, Dr. Saleh Sbenaty, Dr. Chong Chen

Completion Date:
08/24/2015

Analysis of Results for Measure 2:
(include strengths & weaknesses):
Measure 2 Results: The Electrical Construction Management (ECM) Capstone presentation to industry is the result of the culmination project for the entire ECM program. Industry leaders and MTSU professors act as judges and score the presentations based on the scoring rubric. The rubric includes this statement, ("Please rank the candidate's readiness for employment in the Electrical Construction Management Industry. Use 5 as most ready and 1 as least ready.") This measure was met as the average score was 4.3 and the criteria for success was 3.9. The Capstone scoring rubric and the score sheet are attached (ECM Capstone CMT 4172 Score Sheet 2014-2015 and Capstone CMT 4172 Scores 2014-2015). Measure 2

resources are needed.):
Strengths: As part of the scoring of the Capstone presentation, the judges are asked to rank the candidate's readiness for employment in the Electrical Construction Management Industry (using 5 as most ready and 1 as least ready). We find this measure to be very strong because the learning outcomes are based on what industry feels like the graduating student needs in order to show competency by the time of graduation. If industry ranks the student highly, we feel this is an indication of success in the mastery of the learning outcomes. Measure 2

Weakness: Industry leaders and MTSU professors score the Capstone manual and presentation. These scores indicate the level of competency in all of the learning outcomes of the program. When the students’ scores indicate they are competent in the learning outcomes, the “readiness for employment scores” are also higher. Although the students met the criteria for success by scoring an average of 4.3 on the Likert scale (3.9 was the criteria for success), there were still some weaknesses. 1) The students (especially the ones who have completed their classes online) tend to be weaker in the area of formal presentations. They tend to dress less professionally and depend more on their notes during the presentation, 2) The students did not take advantage of the examples available of previous Capstone manuals. Currently this is more difficult for the online students than the students who take classes on campus.

Measure 3:
Measure 3 Assessment tool: Results from the CMT ECM Senior Learning Outcome Survey given to graduating seniors.
Person(s) Responsible: Dr. David Hatfield, Mr.
Analysis of Results for Measure 3: (include strengths & weaknesses)
Measure 3 Results: The CMT ECM Senior Learning Outcome Survey is
Measure 3 Criteria for Success: Students will answer yes at least 70% of the time to this question, As a graduating construction student do you feel that you have the general knowledge to be able to visualize the final product before the conceptual plan is developed?

Duane Vanhook, Dr.
Saleh Sbenaty, Dr.
Chong Chen

Completion Date: 08/24/2015

The CMT ECM Senior Learning Outcome Survey asks the students for their opinion of their success in the mastery of the ten learning outcomes of the ECM program. The results from the CMT ECM Senior Learning Outcome Survey showed that 100% were able to answer yes to the question on the survey relating to this learning outcome and the criteria for success was 70%. This outcome was met. The CMT ECM Senior Learning Outcome Survey and results are attached (CMT ECM Senior Learning Outcome Survey 2014-15 and Senior Learning Outcome Results 2014-15).

Measure 3 Strengths: The students met the criteria for success for this learning outcome with 100% of the students responding “yes” when asked if they felt that they were able to evaluate and apply knowledge gained in construction methods, materials, codes, specifications, and plan reading to electrical construction projects. This measure is based completely on the students’ perception of their mastery of the individual learning outcomes.

Measure 3 Weakness: The students’ opinion of their achievement of this learning outcome tends to be greater than industry leaders’ expectations as provided in the Capstone scores. The students need more guidelines throughout the program with specific illustrations of how industry would perceive success of this learning outcome to have been met.