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| **Assurance of Student Learning Report****2023-2024** |
| *Ogden College of Science and Engineering* | *School of Engineering and Applied Sciences* |
| *Mastee of Science Engineering Management 0447* |
| *Mark Doggett* |
| ***Is this an online program***? [x]  Yes [ ]  No | Please make sure the Program Learning Outcomes listed match those in CourseLeaf . Indicate verification here [x]  Yes, they match! (If they don’t match, explain on this page under **Assessment Cycle)** |

**\*\*\* Please include Curriculum Map as part of this document (at the end), NOT as a separate file.**

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| ***Use this page to list learning outcomes, measurements, and summarize results for your program. Detailed information must be completed in the subsequent pages. Add more Outcomes as needed.*** |
| **Program Student Learning Outcome 1 Graduates will demonstrate the knowledge and capacity to apply managerial/ leadership principles and practices to appropriate situations.** |
| **Instrument 1** | Certified Technology Manager exam questions in the categories of “Leadership” and “Self-Management” |
| **Instrument 2** | Certified Technology Manager exam questions in the category of “People”  |
| **Instrument 3** | Certified Technology Manager exam questions in the categories of “Quality” and “Risk” |
| **Based on your results, check whether the program met the goal Student Learning Outcome 1.** | **[x]  Met** | **[ ]  Not Met** |
| **Program Student Learning Outcome 2: Graduates will possess/ demonstrate the ability to identify, formulate, and solve technical problems** |
| **Instrument 1** | Certified Technology Manager exam questions in the category of “Systems” |
| **Instrument 2** | Certified Technology Manager exam questions in the category of “Processes” |
| **Instrument 3** | Certified Technology Manager exam questions in the categories of “Operations” and “Projects” |
| **Based on your results, check whether the program met the goal Student Learning Outcome 2.** | **[x]  Met** | **[ ]  Not Met** |
| **Program Student Learning Outcome 3: Graduates will demonstrate an ability to communicate effectively in pertinent areas, both written and oral.** |
| **Instrument 1** | Thesis and project abstract scores |
| **Instrument 2** | Thesis and project oral presentation scores  |
| **Instrument 3** | N/A |
| **Based on your results, check whether the program met the goal Student Learning Outcome 3.** | **[x]  Met** | **[ ]  Not Met** |
| **Assessment Cycle Plan:**  |
| In 2023-2024, MSEM graduate students took the ATMAE exam *(N=4)*. The program outcomes were met, and students performed well in all categories. In 2022, Students who applied to the MSEM program were asked to provide evidence of sucessful completion in a statistics or quality control course taken during or after their undergraduate studies. In addition, the statistics or quality control course should be completed with a passing grade within the last four years. Program faculty may want to consider adding a graduate statistics course as a program requirement. In 2023-2024, MSEM students completed a thesis or graduate project (*N=3*). The program outcomes were met, and students performed well in in both writing and presentation. The program will continue to monitor.  |

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| **Program Student Learning Outcome 1** |
| **Program Student Learning Outcome**  | Graduates will demonstrate the knowledge and capacity to apply managerial/ leadership principles and practices to appropriate situations. |
| **Measurement Instrument 1**  | DIRECT MEASURE: Certified Technology Manager exam questions in the categories of “Leadership” and “Self-Management”Graduate students enrolled in Thesis (EGMT 599) or Graduate Project (EGMT 690) are required to take the ATMAE Certified Technology Manager (CTM) exam. Leadership is a process of social influence, which maximizes the efforts of others towards the achievement of goals. The Leadership category includes 10 questions. Self-management is the methods, skills, and strategies by which individuals can effectively direct their own activities toward the achievement of goals and objectives. The Self-Management category includes 18 questions. |
| **Criteria for Student Success** | The goal for graduate students is to have an average performance in each exam category that meets or exceeds the passing threshold (60%). The passing threshold represents over 100 accredited programs across the U.S. that use this exam to meet standards for numerous industry professions. |
| **Program Success Target for this Measurement** | 60% | **Percent of Program Achieving Target** | 100% |
| **Methods**  | Certified Technology Manager (CTM) exam offered by the Association of Technology, Management, and Applied Engineering (ATMAE). The exam is two hours and must be taken in a proctored setting. Scores are tallied and sent to the program by ATMAE. In 2023-2024, *(N=4)* MSEM graduate students took the exam. 100% of students achieved 60% or more in Leadership category. 100% of students achieved 60% or more in the Self-Management category.  |
| **Measurement Instrument 2** | DIRECT MEASURE: Certified Technology Manager exam questions in the category of “People”Graduate students enrolled in Thesis (EGMT 599) or Graduate Project (EGMT 690) were required to take the ATMAE Certified Technology Manager (CTM) exam. Managing people involves the deployment and handling of human resources to work together to accomplish desired goals and objectives using available resources efficiently and effectively. The People category includes 19 questions. |
| **Criteria for Student Success** | The goal for graduate students is to have an average performance in each exam category that meets or exceeds the passing threshold (60%). The passing threshold represents over 100 accredited programs across the U.S. that use this exam to meet standards for numerous industry professions. |
| **Program Success Target for this Measurement** | 60% | **Percent of Program Achieving Target** | 100% |
| **Methods** | Certified Technology Manager (CTM) exam offered by the Association of Technology, Management, and Applied Engineering (ATMAE). The exam is two hours and must be taken in a proctored setting. Scores are tallied and sent to the program by ATMAE. In 2023-2024, *(N=4)* MSEM graduate students took the exam. 100% of students achieved 60% or more in the category of People. |
| **Measurement Instrument 3** | DIRECT MEASURE: Certified Technology Manager exam questions in the categories of “Quality” and “Risk”Graduate students enrolled in Thesis (EGMT 599) or Graduate Project (EGMT 690) were required to take the ATMAE Certified Technology Manager (CTM) exam. Risk management is the identification, assessment, and prioritization of risk followed by coordinated and economical application of resources to minimize, monitor, and control their probability and/or impact. The Risk category includes 7 questions. Quality management involves the use of quality assurance and control of processes and products to achieve consistent and predictable quality. The Quality management category includes 19 questions. |
| **Criteria for Student Success** | The goal for graduate students is to have an average performance in each exam category that meets or exceeds the passing threshold (60%). The passing threshold represents over 100 accredited programs across the U.S. that use this exam to meet standards for numerous industry professions. |
| **Program Success Target for this Measurement** | 60% | **Percent of Program Achieving Target** | 75% |
| **Methods** | Certified Technology Manager (CTM) exam offered by the Association of Technology, Management, and Applied Engineering (ATMAE). The exam is two hours and must be taken in a proctored setting. Scores are tallied and sent to the program by ATMAE. In 2023-2024, (N=4) graduate students took the exam. 75% of students achieved 60% or more in the Risk category. 75% of students achieved 60% or more in the Quality category. |
| **Based on your results, highlight whether the program met the goal Student Learning Outcome 1.** | **[x]  Met** | **[ ]  Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** |
| **Results**:For 2023-2024, four MSEM graduate students took the exam. Based on the exam category scores:100% of students achieved 60% or more in Leadership category. 100% of students achieved 60% or more in the Self-Management category.100% of students achieved 60% or more in the People catagory.75% of students achieved 60% or more in the Risk category. 75% of students achieved 60% or more in the Quality category.**Conclusions**: These results indicate that students performed well in all categories, with some possible improvement in the Risk and Quality categories. **Plans for Next Assessment Cycle**: Assessment Time: This outcome will be assessed in May of each year.Courses sampled: Certified Technology Manager (CTM) exam offered by the Association of Technology, Management, and Applied Engineering (ATMAE). The exam is offered once a year in April for Graduate Project (EGMT 690) students and Thesis (EGMT 599) students. Data/artifacts will be collected: Certified Technology Manager exam questions in “Leadership” and “Self-Management”Certified Technology Manager exam questions in “People”Certified Technology Manager exam questions in “Quality” and “Risk”Faculty responsible for collecting and providing data and information:Students on campus will be proctored by a faculty member for the Certified Technology Manager ATMAE exam, while students who are not on campus will be proctored by approved testing centers. The instructor of record will provide data for Graduate Project (EGMT 690) students and the program coordinator will provide data for Thesis (EGMT 599) students and analyze the overall exam data.Further development of content to improve student performance in the Quality and Risk categories should be considered. A statistics or quality control undergraduate course should be completed with a passing grade within the last four years. Program faculty may want to consider adding a graduate statistics course as a program requirement. |

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| **Program Student Learning Outcome 2** |
| **Program Student Learning Outcome**  | Graduates will possess/ demonstrate the ability to identify, formulate, and solve technical problems. |
| **Measurement Instrument 1** | DIRECT MEASURE: Certified Technology Manager exam questions in “Systems”Graduate students enrolled in Thesis (EGMT 599) or Graduate Project (EGMT 690) are required to take the ATMAE Certified Technology Manager (CTM) exam. Systems consist of the management of technology across disciplines and companies in an integrated fashion for the purpose of business venture and development. The System category includes 18 questions. |
| **Criteria for Student Success** | The goal for graduate students is to have an average performance in each exam category that meets or exceeds the passing threshold (59.38%). The passing threshold represents over 100 accredited programs across the U.S. that use this exam to meet standards for numerous industry professions. |
| **Program Success Target for this Measurement** | 60% | **Percent of Program Achieving Target** | 75% |
| **Methods**  | Certified Technology Manager (CTM) exam offered by the Association of Technology, Management, and Applied Engineering (ATMAE). The exam is two hours and must be taken in a proctored setting. Scores are tallied and sent to the program by ATMAE. In 2023-2024, (N=4) graduate students took the exam. 75% of students achieved 60% or more in the Systems category. |
| **Measurement Instrument 2** | DIRECT MEASURE: Certified Technology Manager exam questions in the category of “Processes”Graduate students enrolled in their first semester of Thesis (EGMT 599) are required to take the ATMAE Certified Technology Manager (CTM) exam. A process is the transformation of input elements into output elements with specific properties, within defined parameters or constraints. The Processes category includes 19 questions. |
| **Criteria for Student Success** | The goal for our graduate students to have an average performance in each exam category that meets or exceeds the passing threshold (59.38%). The passing threshold represents over 100 accredited programs across the U.S. that use this exam to meet standards for numerous industry professions. |
| **Program Success Target for this Measurement** | 60% | **Percent of Program Achieving Target** | 100% |
| **Methods** | Certified Technology Manager (CTM) exam offered by the Association of Technology, Management, and Applied Engineering (ATMAE). The exam is two hours and must be taken in a proctored setting. Scores are tallied and sent to the program by ATMAE. In 2023-2024, (N=4) graduate students took the exam. 100% of students achieved 60% or more in Processes category. |
| **Measurement Instrument 3** | DIRECT MEASURE: Certified Technology Manager exam questions in the categories of “Operations” and “Project”Graduate students enrolled in Thesis (EGMT 599) or Graduate Project (EGMT 690) are required to take the ATMAE Certified Technology Manager (CTM) exam. Operations management is the management of technology within a specific industrial specialty. The Operation category includes 19 questions. Projects are the one-time application of a process to produce a unique product or service. The Project category includes 19 questions. |
| **Criteria for Student Success** | The goal for our graduate students to have an average performance in each exam category that meets or exceeds the passing threshold (59.38%). The passing threshold represents over 100 accredited programs across the U.S. that use this exam to meet standards for numerous industry professions. |
| **Program Success Target for this Measurement** | 60% | **Percent of Program Achieving Target** | 100% |
| **Methods** | Certified Technology Manager (CTM) exam offered by the Association of Technology, Management, and Applied Engineering (ATMAE). The exam is two hours and must be taken in a proctored setting. Scores are tallied and sent to the program by ATMAE. In 2023-2024, (N=4) graduate students took the exam. 100% of students achieved 60% in the Operations category.100% of students achieved 60% in the Project category. |
| **Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 2.** | **[x]  Met** | **[ ]  Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** |
| **Results**:In 2023-2024, four graduate students took the exam. 75% of students achieved 60% or more in the System category, 100% of students achieved 60% or more in the Processes category.100% of students achieved 60% or more in the Operation category.100% of students acheived 60% or more in the Project category.**Conclusions**:These results indicate that students performed well in all catagories, with some possible improvement in the Systems category. **Plans for Next Assessment Cycle:**Assessment Time: This outcome will be assessed in May of each year.Courses sampled: Certified Technology Manager (CTM) exam offered by the Association of Technology, Management, and Applied Engineering (ATMAE). The exam is offered once a year in April for Graduate Project (EGMT 690) students and for Thesis (EGMT 599) students. Data/artifacts will be collected: Certified Technology Manager exam questions in “Systems”Certified Technology Manager exam questions in “Processes”Certified Technology Manager exam questions in “Operations” and “Projects”Faculty responsible for collecting and providing data and information:Students on campus will be proctored by a faculty member for the Certified Technology Manager ATMAE exam, while students who are not on campus will be proctored by approved testing centers. The instructor of record will provide data for Graduate Project (EGMT 690) students and the program coordinator will provide data for Thesis (EGMT 599) students and analyze the overall exam data.Evaluation of the technical course content should be continued and will be reviewed at graduate faculty meetings. |

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| **Program Student Learning Outcome 3** |
| **Program Student Learning Outcome**  | Graduates will demonstrate an ability to communicate effectively in pertinent areas, both written and oral. |
| **Measurement Instrument 1** | DIRECT MEASURE: Thesis and graduate project abstract scores. |
| **Criteria for Student Success** | The goal is graduate students’ average performance in the Thesis (EGMT 599) or Graduate Project (EGMT 690) abstracts meets or exceeds the “Competent” level in the grading rubric. Grading rubric criteria: Mastery (5 points), Competent (4 points), Marginal (3 points), Deficient (2 points), and Unacceptable (1 point). |
| **Program Success Target for this Measurement** | 60% | **Percent of Program Achieving Target** | 66% |
| **Methods**  | The thesis and graduate project abstracts are scored by the thesis committees or the instructor of record for the graduate project. The abstracts are evaluated based on three criteria: 1) organization and appearance, 2) subject content, and 3) writing mechanicsIn 2023-2024, (N= 3) graduate students completed an abstract. 66% of students achieved a “Competent” level or higher in the written abstract grading rubric. |
| **Measurement Instrument 2** | DIRECT MEASURE: Thesis and graduate project oral presentation scores. |
| **Criteria for Student Success** | The goal is graduate students’ average performance in the Thesis (EGMT 599) or Graduate Project (EGMT 690) oral presentation meets or exceeds the “Competent” level in the grading rubric. The grading rubric criteria: Mastery (5 points), Competent (4 points), Marginal (3 points), Deficient (2 points), and Unacceptable (1 point). |
| **Program Success Target for this Measurement** | 60% | **Percent of Program Achieving Target** | 100% |
| **Methods** | The thesis and graduate project oral presentations are scored by the thesis committees or the instructor of record for the graduate project. The oral presentations are evaluated based on four criteria: 1) delivery and style, 2) validity and scholarly justification, and 3) presentation format and organization, and 4) presentation content. In 2023-2024, (N= 3) graduate students completed an oral presentation. 100% of students achieved a “Competent” level or higher in the written abstract grading rubric. |
| **Measurement Instrument 3** | N/A |
| **Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 3.** | **[x]  Met** | **[ ]  Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** |
| **Results**:Thesis and non-thesis students in the MSEM program are required to submit a proposal abstract and give an oral presentation upon completion. The thesis abstracts and oral defenses are scored by the thesis committee. Non-thesis students abstracts and oral presentations are scored by the instructor of record for the graduate project.**Conclusions**:The target measures indicate graduates are achieving competences at the desired levels.**Plans for Next Assessment Cycle:**Assessment Time: This outcome will be assessed in May of each year.Courses sampled: Thesis oral presentations and thesis written abstracts for EGMT 599. Thesis oral presentation and thesis written abstract score collection times depend on when graduate students submit their proposals and defend their theses. Oral presentations and written abstracts for EGMT 690 Graduate Project. Oral presentations and written abstract score collection times will occur every spring semester. Data/artifacts will be collected: Student Written Communication Artifacts: 1) organization and appearance, 2) subject content, and 3) writing mechanics. Student Oral Communication Artifacts: 1) delivery and style, 2) validity and scholarly justification, and 3) presentation format and organization, and 4) presentation content. Faculty responsible for collecting and providing data and information:Thesis chair and committee members are responsible for collecting the thesis written and oral presentation data from each student. The assigned instructor of record for EGMT 690 Graduate Project is responsible for collecting the written and oral presentation data from each student.Continue to monitor and collect data for oral presentation and abstract scores for each graduate student. In 2024, students enrolled in the Graduate Project (EGMT 690) were required to give an oral presentation of their project. The goal is for 60% of students to achieve a score of 4 or better (on a five-point scale) for both the abstract and oral presentation.The MSEM program was amended in 2022 to include both thesis and non-thesis concentrations. The non-thesis students do not submit a thesis, but are required to take one additional graduate course. The impact of this change appears to be positive. |

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| **CURRICULUM MAP** |  |  |  |
| **Program name:** | Master of Science Engineering Management  |  |  |
| **Department:** | School of Engineering & Applied Sciences  |  |  |
| **College:** | Ogden College of Science & Engineering  |  |  |
| **Contact person:** |  Mark Doggett |  |  |
| **Email:** | mark.doggett@wku.edu |  |  |
| **KEY:** |  |  |  |  |
| **I = Introduced** |  |  |  |  |
| **R = Reinforced/Developed** |  |  |  |  |
| **M = Mastered** |  |  |  |  |
| **A = Assessed** |  |  |  |  |
|  |  |  | **Learning Outcomes** |  |  |
|  |  |  | **LO1:** | **LO2:** | **LO3:** |
|   |  |  | Graduates will demonstrate the knowledge and capacity to apply managerial/ leadership principles and practices to appropriate situations. | Graduates will possess/ demonstrate the ability to identify, formulate, and solve technical problems. | Graduates will demonstrate an ability to communicate effectively in pertinent areas, both written and oral.  |
| **Course Subject** | **Number** | **Course Title** |   |   |   |
| EGMT | 510 | Emerging Technologies | I | R | R |
|   | 520 | Resource Management | M | R | R |
|   | 530 | Automated Data Collection Systems |   | R |   |
|   | 535 | Workforce Development | R | I |   |
|   | 540 | Theory of Constraints  | R | M | R  |
|   | 571 | Research Methods in Tech |   | R | M |
|   | 580 | Six Sigma Quality  | R | M | R |
|   | 588 | Product Development | I | R | R |
|   | 590 | Operations Leadership | M |   | R |
|   | 594 | Lean Systems | I | M |   |
|   | 630 | Legal & Ethics Issues in Technology | R |   | R  |
|   | 650 | Supply Chain Management | R | I |   |
|   | 655 | Project Management | R | M | R |
|   | 671 | Quality Management | R | M | R |
|  | 599 | Thesis | R | R | A |
|  | 690 | Graduate Project | R | R | A |