**Sinclair Community College**

**Continuous Improvement Annual Update 2015-16**

**Please submit to your Division Assessment Coordinator / Learning Liaison for feedback no later than March 1, 2016**

**After receiving feedback from your Division Assessment Coordinator, please revise accordingly and make the final submission to your dean and the Provost’s Office no later than May 2, 2016**

**Department:** **SME - 0551 – Mechanical Engineering Technology**

Year of Last Program Review: FY 2010-2011

Year of Next Program Review: FY 2016-2017

**Section I: Progress Since the Most Recent Review**

Below are the goals from Section IV part E of your last Program Review Self-Study. Describe progress or changes made toward meeting each goal over the last year. Responses from the previous year’s Annual Update are included, if there have been no changes to report then no changes to the response are necessary.

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| **GOALS** | **Status** | **Progress or Rationale for No Longer Applicable** |
| NEED TO BE DEVELOPED. Self-study simply notes that “Comments made in sections a through d above describe the department’s direction in curriculum and course delivery and innovative applied learning techniques”. | In progress  Completed  No longer applicable | Both the MET and HVACR programs investigate and use various techniques to improve student learning based upon goals provided by the industry we serve as delivered by our advisory committess.  For example, the guitar class provides a serious look into product lifecycle management using a vehicle students find fun and attractive. This has been so successful that we use it as a recruiting tool in area high schools.  Additionally, our MET capstone project over the last three years involved the design and construction of the SAE baja buggy. This project included heavy industry involvement, hands‑on activity components, and applied learning.  Similary, the Integrated Capstone for the HVAC program (which involved working with Archtectural, Civil, Construction Management, and Environmental) has provided students with a near 'real life' experience replete with proper design process, discussions with industry engineers and sales persons, and interpersonal issues that require solution so as to get the job done.  The HVAC program has also been well supported by industry. Local business has donated thens of thousands of dollars in money and equipment to improve our education in HVAC controls and systems. This has included $25,000 worth of control products, $5,000 from ASHRAE to aid in the construction of a HW/CW system on which we will be able to train, and a new geothermal heat pump unit.  Also, local HVAC industry professionals visit our second year classes to make presentations to our students on current technologies relevant to the profession. We currently have six persons providing such activities in four separate (quarter) courses. Such discussions serve to reinforce to the student all the material they've been learning in the classroom.  Our HVAC students are all student members of ASHRAE. As such, they make at least two visits to a local chapter student nights each year. These visits are a required activity that is part of the second year curriculum. These visits result in our students gaining exposure to local industry professionals often resulting in an offer for a job interview. |

Below are the Recommendations for Action made by the review team. Describe the progress or changes made toward meeting each recommendation over the last year. Responses from the previous year’s Annual Update are included, if there have been no changes to report then no changes to the response are necessary.

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| **RECOMMENDATIONS** | **Status** | **Progress or Rationale for No Longer Applicable** |
| While learning experiences designed to facilitate the achievement of general education outcomes as well as program outcomes appear to be in place, there is no documented evidence that those outcomes are being met. Support is available through the College-Wide Assessment Committee to design methods for collecting, analyzing, and documenting these outcomes. | In progress  Completed  No longer applicable | Although such evidence is collected throughout the program, the primary point of assessment occurs during capstone. Students are required to provide a number of written documents, presentations, and a final design. These documents are presented to the advisory members for comment and graded/assessed by capstone faculty. Shortcomings are documented under our capstone project 'Lessons Learned' list with improvements enacted over the following year where appropriate. |
| The department should consider the value of and need for the AAS degree in MET, given the current emphasis on the four year technical degree. Students with interest in mechanical engineering might be better served by the Engineering Science University Parallel degree. | In progress  Completed  No longer applicable | The MET program is one of the three most highly recognizable and one of the most popular engineering technology programs that can exist at any school nationally. Elimination of this program would be quite quite hurtful to the local community. This program does feed many of the area four-year engineering technology programs including University of Dayton and Miami University.  As the name implies, the Engineering Science University Parallel program serves a completely different audience than the MET program. ESUP is a pre‑engineering degree that transfers to any school with a four‑year Engineering Science curriculum such as Wright State and the University of Dayton. (Please note that UD has both Engineering Science and Engineering Technology programs) |
| The department is encouraged to confer with the Mathematics Department to explore means of improving student success. The formation of learning communities between math and early program courses might be an effective strategy. | In progress  Completed  No longer applicable | We have been reviewing the math sequencing in both programs to ensure it meets or exceeds industry standards and needs especially as we look to expand the MET program at Courseview. Miami University would be the closest school to which students enrolled at Courseview in MET might attend and alignment with their math requirements will allow a smoother transition for students.  A recent revision of the curriculum has replaced Tech Math with MAT1580 Precalculus in hopes of better preparing students for both industry and continuing education. |
| Examine degree and certificate completion rates for the department’s programs and identify factors that contribute to low completion rates. Determine whether low productivity programs should be revised in order to attract and graduate more students or whether selected offerings should be discontinued. | In progress  Completed  No longer applicable | Trend data indicates increased completion rates. Our efforts have been successful and we will continue those efforts. |

**Section II: Assessment of General Education & Degree Program Outcomes**

The Program Outcomes for the degrees are listed below. **All program outcomes must be assessed at least once during the 5 year Program Review cycle, and assessment of program outcomes must occur each year**.

**PLEASE NOTE – FOR THE PREVIOUS YEAR AND THIS YEAR, REPORTING OF GENERAL EDUCATION OUTCOME ASSESSMENT HAS BEEN TEMPORARILY POSTPONED. WE WOULD ASK THAT IN THIS ANNUAL UPDATE YOU IDENTIFY AT LEAST ONE COURSE IN YOUR DEGREE PROGRAM(S) WHERE ASSESSEMENT AT THE MASTERY LEVEL WILL OCCUR FOR THE FOLLOWING GENERAL EDUCATION OUTCOME:**

* **Cultural Diversity & Global Citizenship: Apply knowledge of cultural diversity to real world context by acknowledging, understanding, and engaging constructively within the contemporary world.**

**PLEASE RESPOND TO THE FOLLOWING QUESTIONS:**

**Do you have a required course in your program curriculum where Cultural Diversity & Global Citizenship could be assessed for mastery?**

**Yes No If yes, please list the course: MET2711 Ethics for Engineering Technology Professionals**

**If no, is there an elective course that is listed on your Preferred Program Pathway Template where Cultural Diversity & Global Citizenship could be assessed for mastery?**

**Yes No If yes, please list the course:** Click here to enter text.

**If no, is there another elective course that is an option in your program curriculum where Cultural Diversity & Global Citizenship could be assessed for mastery?**

**Yes No If yes, please list the course:** Click here to enter text.

**If no, where do students master Cultural Diversity & Global Citizenship in your program? Do you need assistance incorporating this General Education outcome into your degree program?**

Click here to enter text.

**NOTE THAT THERE WILL NEED TO BE AT LEAST ONE EXAM / ASSIGNMENT / ACTIVITY IN THIS COURSE THAT CAN BE USED TO ASSESS MASTERY OF THE COMPETENCY.**

**YOU MAY ALSO SUBMIT ASSESSMENT RESULTS FOR THIS GENERAL EDUCATION COMPETENCY IF YOU HAVE THEM, BUT IT WILL BE CONSIDERED OPTIONAL**.

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| **Mechanical Engineering Technology**  **Program Outcomes** | To which course(s) is this program outcome related? | Year assessed or to be assessed. | Assessment Methods  Used | What were the assessment results?  (Please provide brief summary data) |
| Use mathematical and scientific skills to analyze product properties including form, function, fit, strength, thermal and fluid properties, etc. | MET1111  MET1161  MET1231  MET1241  MET1281  MET1301  MET2151  MET2201  MET2251  MET2301  MET2351  MET2401  MET2780  CAM1109 | 2014-15 | Assessment of capstone.  Strength of Materials Highway sign project and presentation. | Feedback from industry led advisory board members showed favorable opinions of the educational achievements of capstone students.  2016: 70% of the students successfully determined wind speed and loads using fluid dynamic equations utilizing local/federal codes, calculated maximum principal stresses and location where it occurred, and used the maximum stresses to design appropriate supporting structures and cross-sectional geometries. |
| Recognize professional ethical and societal responsibilities, respect diversity and demonstrate a commitment to life-long learning. | MET1231  MET1281  MET2711  MET2780 | 2015 | Challenger case and KC Skywalk case w/ written rubrics for Professionalism  NSPE Ethics quiz for ethical responsibilities  Diversity, Risky Tank case w/written rubric  Trademark Copyright Case | 2016:  Challenger Case:  Average score: 91.1% (spring) 100% (fall)  Students achieving 70% threshold:  90% (spring) 100% (fall)  KC Skywalk Case:  Average score: 81.3% (spring) 82% (fall)  Students achieving 70% threshold:  90% (spring) 100% (fall)  NSPE Ethics Quiz  Average score: 82.6% (spring) 84% (fall)  Students achieving 70% threshold:  91% (spring) 100% (fall)  Risky Tank (Diversity:  Average score: 72.4% (spring) 91.2% (fall)  Students achieving 70% threshold:  64% (spring) 100% (fall)  The FTF section had 100% successful completion.  In the online section 70% of the students successfully completed the assignment. |
| Design in detail individual parts from functional sketches provided by an engineer, and model them using a three-dimensional parametric modeler. (i.e. 3-D CAD) | MET1231  MET1281  MET2711  MET2780 | 2015-16 | Assessment of capstone.  Graduate exit interviews.  Employer surveys.  Co-op feedback.  Solidworks Technical Report | Advisory board members had favorable evaluations of students.  The department was able to secure capital funding to purchase a newer 3D printer. Additional curriculum is being designed to utilize its advanced features.  2016: 70% of the students successfully complete the Assignment  Students met the assessment with a 70% completion average.  70% of the capstone students successfully complete the tasks listed under “Description of Points Assessed”. |
| As an interdisciplinary team member, develop products, processes, solve problems, perform project planning, prepare time estimates and make sound ethical decisions. | MET1231  MET1241  MET1301  MET2780 | 2015-2016 | Assessment of capstone.  Graduate exit interviews.  Employer surveys.  Co-op feedback.  Strength of Materials Highway Sign Project | Advisory board members had favorable evaluations of students.  Students in the capstone course have worked with outside industry partners. Evaluations from those partners were also favorable.  Exit interviews indicate that students liked working with industry partners on real projects.  2016: 70% of the students successfully evaluated codes, established design objectives, designed the appropriate supporting structure, and evaluated their design for safety by calculating safety factors in a team environment.  70% of the students successfully complete the tasks listed under “Description of Points Assessed”. |
| Communicate effectively orally, in writing and graphically on an interdisciplinary team as a design technician using appropriate tools | MET1231  MET1241  MET1281  MET2711  MET2780 | 2015 | Oral communication: real-world ethics case presentation graded by rubric  Written communication, final case graded by rubric  Strength of Materials Highway Sign Project | Real-world ethics case oral presentation: Average score: 87.6% (spring) 95.3% (fall)  Students achieving 70% threshold:  91% (spring) 100% (fall)  Final ethics case: Average score: 84% (spring) 88.2% (fall)  Students achieving 91% threshold:  100% (spring) 100% (fall)  2016: 70% of the students successfully communicated their results and calculation during the semester and at the end of the semester using CAD models, Power Point presentations, tables and graphs using Excel, and written reports. |
| Document the product/process model using appropriate means (multi-view drawings, pictorials, catalog/manual illustrations, charts/graphs, shaded image, animation, etc.) | MET1231  MET1241  MET1281  MET1301  MET2780 | 2013-14 | Locally developed tests and quizzes.  Lab observations.  Candy Dispenser Project | Students have a low rate of injury in the lab. Student to teacher ratios are kept to a manageable number.  2016: The FTF section had 80% successful completion of a 70% or better score on the project.  In the online section 66% of the students successfully completed the assignment with a score of 70% or better. 3 of the online students ran out of time in getting the assignments in. This contributed to the lower percentage score. 4 out of 4 of the successful completers of the course finished the project successfully. |

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| **Are changes planned as a result of the assessment of program outcomes? If so, what are those changes?** | Capstone continues to provide students with a challenging learning exercise that draws upon their prior coursework. Capstone projects will continue to evolve as needs of industry present themselves.  Working with industry partners also helps to give students ownership to capstone projects. More partner projects will be sought. |
| **How will you determine whether those changes had an impact?** | Feedback from advisory board during Capstone midterm presentations  Feedback from advisory board members at Capstone Expo and dinner at end of semester  Results of accreditation efforts in October 2016.  Feedback from self-study report for accreditation.  Feedback from internship partners. |