**Sinclair Community College - Continuous Improvement Annual Update 2011-12**

**Program:** Engineering Technology Design

**Section I: Trend Data**

* **Selected Course Success Rates**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **2008-09** |  |  | **2009-10** | **2010-11** |  |  |
|  |  |  | Success seat | Total seat | Success rate % | Success seat | Total seat | Success rate % | Success seat | Total seat | Success rate % | 3-year Success Rate % | TREND |
| ***ETD*** | ***101*** |  | ***85*** | ***119*** | ***71.43%*** | ***67*** | ***111*** | ***60.36%*** | ***76*** | ***103*** | ***73.79%*** | ***68.47%*** | ***EVEN*** |
| *ETD* | *110* |  | *18* | *21* | *85.71%* | *33* | *35* | *94.29%* | *38* | *40* | *95.00%* | *92.71%* | *EVEN* |
| ***ETD*** | ***121*** |  | ***40*** | ***50*** | ***80.00%*** | ***76*** | ***94*** | ***80.85%*** | ***94*** | ***148*** | ***63.51%*** | ***71.92%*** | ***DOWN*** |
| ***ETD*** | ***128*** |  | ***279*** | ***385*** | ***72.47%*** | ***186*** | ***250*** | ***74.40%*** | ***115*** | ***167*** | ***68.86%*** | ***72.32%*** | ***DOWN*** |
| ***ETD*** | ***198*** |  | ***346*** | ***466*** | ***74.25%*** | ***434*** | ***594*** | ***73.06%*** | ***387*** | ***547*** | ***70.75%*** | ***72.62%*** | ***DOWN*** |
| ***ETD*** | ***199*** |  | ***236*** | ***307*** | ***76.87%*** | ***237*** | ***316*** | ***75.00%*** | ***255*** | ***327*** | ***77.98%*** | ***76.63%*** | ***EVEN*** |
| *ETD* | *211* |  | *26* | *37* | *70.27%* | *26* | *32* | *81.25%* | *32* | *47* | *68.09%* | ***72.41%*** | *EVEN* |
| *ETD* | *212* |  | *26* | *34* | *76.47%* | *21* | *27* | *77.78%* | *27* | *33* | *81.82%* | ***78.72%*** | *UP* |
| *ETD* | *213* |  | *36* | *58* | *62.07%* | *43* | *87* | *49.43%* | *43* | *66* | *65.15%* | *57.82%* | *UP* |
| *ETD* | *278* |  | *13* | *13* | *100.00%* | *17* | *17* | *100.00%* | *19* | *20* | *95.00%* | *98.00%* | *EVEN* |
| *ETD* | *284* |  | *32* | *34* | *94.12%* | *41* | *44* | *93.18%* | *31* | *33* | *93.94%* | *93.69%* | *EVEN* |
|  |  |  |  |
| **OVERALL ETD** |  |  | **80.27%** |  |  |  | **81.43%** |  |  | **84.50%** |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |

* **Enrollment Trends**
* **Degree and certification completion, 5 years**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | **Total Per Degree** |
|   |   | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 |
| DRT AAS Degree (legacy) |   |  |  | 1 | 1 |  | 2 |
| ETD AAS Mechanical -CAD |   |  | 2 |  | 2 | 6 | 10 |
| IDGT AAS Graphic Tech (legacy) |   | 3 | 5 |  |  |  | 8 |
| **Drafting-oriented Degrees** |  | **3** | **7** | **1** | **3** | **6** | **20** |
| EMT AAS Mechanical (legacy) |   | 12 | 15 | 7 | 2 |  | 36 |
| MEGT AAS Mechanical |   |  |  | 5 | 6 | 9 | 20 |
| **Mechanical Technology Degrees** |  | **12** | **15** | **12** | **8** | **9** | **56** |
|  |  |  |  |  |  |  |  |
| **Total Degrees Awarded** |  | **15** | **22** | **13** | **19** | **15** | **76** |
|   |   |  |  |  |  |  |  |
| **Drafting-Design STC** |  | **3** | **5** | **4** | **5** | **7** | **24** |

1. **Interpretation and Analysis of Trend Data Included in the Section Above *Suggestions of questions that might be addressed in this section:***  *What trends do you see in the above data? Are there internal or external factors that account for these trends? What are the implications for the program or department? What actions have the department taken that have influenced these trends? What strategies will the department implement as a result of this data?*

The cells show major classes below 70% (RED) and above 85% (GREEN) to make it easy to identify successes and challenges. Yellow highlighted cells are highest-enrollment classes.

The Course success rate averages over the last 3 years have seen improvement. The overall rate has improved 4% with a nearly consistent number of students over the last 3 years.

The lowest success rate course is ETD 213, Statics. This is the first solid engineering course students take and many struggle. Efforts in the past two years have revolved around adding on-line media to aid in learning. Initial data is promising and we expect success rates to climb as this is more fully implemented.

ETD 110 and ETD 278 are project–oriented classes that students take after they have been in the program for some time (ETD 278 is the capstone course, where it is expected that students ready to graduate would be successful). ETD students are tending to coalesce into cohorts, which appears to be improving success rates in some of their classes. The highest-enrollment course, ETD 198, has been trending slightly down – we have observed more students than usual failing to complete the course by stopping attendance without dropping the course.

ETD 284 is an advanced software course taken by CAD students as well as a large number of working professionals, which supports the high success rate.

Overall success rates in the two courses offered as part of the Engineering Transfer degree are consistently above 70%, with ETD 212 higher than ETD 211. These classes are taught by the same instructor with a high level of rigor.

Enrollment has been trending up in the degree programs since the department and program changes in 2005-06. Enrollment in the drafting certificates has been steady.

Since the Drafting & Design and Mechanical departments were combined in 2005-06, there are legacy students still completing the original degrees. As shown in the data, more students select the Mechanical degree over the drafting degree – under semesters, these two programs will be merged into one and with an elective that will allow those students interested in additional drafting courses to select a course of their choice.

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There has been consistent demand for the drafting certificate.

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

1. What was the fiscal year of the most recent Program Review for this program?

 2008-09

1. Briefly summarize the goals that were listed in Section IV part E of the most recent Program Review Self-Study (this section of the Self-Study asks “What are the department’s/program’s goals and rationale for expanding and improving student learning, including new courses, programs, delivery formats and locations”)?

 Continue work with Project Lead the Way.

 Continue the development of grants.

 Increasing delivery options of course materials and project-based learning.

1. What Recommendations for Action were made by the review team to the most recent Program Review?
2. Review the value and need for the AAS degree in MET when students have the option for pursuing the Engineering Transfer Degree? The MET AAS provides an option for the student who cannot handle the higher math of the traditional engineering program. Enrollment in the two-year University Transfer degree (MEGT) continues to increase while the stand-alone degree (ETD) decreases. The new semester curriculum eliminates the ETD degree but includes an elective in the MEGT degree to allow for additional design software classes for students who are not immediately university bound.
3. Confer with the mathematics department to explore means of improving student success. An evaluation of the success in statics and the correlation with the math and physics courses the students have taken and grades in those courses the students have taken and the grades in those courses shows no apparent correlation between success in math and physics and success rate in statics. We will continue to study these over the next few years.
4. Have the goals in your self-study changed since your last Program Review Self-Study as a result of the Review Team recommendations or for any other reason?  If so, please describe the changes.

Our primary emphasis is on project-based learning and the use of new and innovative materials. Project based learning is incorporated in several classes such as ETD 118 (Project Realization Process), ETD 222 (Strength of Material), ETD 238 (Project Development and Testing), and ETD 278 (Capstone).

1. What progress has been made toward meeting any of the goals listed in the sections above (b, c, and d) in the past year?

Continued work with Project Lead the Way.

The department faculty members have received several grants for improving and developing new curriculum.

Elevated the engineering capstone learning experience by enrolling in an SAE Baja competition. The competition includes designing, building, testing and competing in an endurance race.

STEM based guitar design and build project is offered as the “first year capstone” (ETD 110) course.

The faculty developed a single MET degree for the semester conversion. This will help eliminate the splintering of students between the degree options.

**Section III: Assessment of Outcomes**

The Program Outcomes for this program are listed below. **At least one-third of your program outcomes must be assessed as part of this Annual Update, and across the next three years all of these program outcomes must be assessed at least once**.

|  |  |  |  |
| --- | --- | --- | --- |
| **Engineering Technology Design**Program Outcomes | In which courses are these program outcomes addressed? | Which of these program outcomes were assessed during the last fiscal year?  | Assessment MethodsUsed |
| **1)** Communicate effectively orally and, in writing and graphically, on an interdisciplinary team, as a design technician using appropriate CADD tools. | ETD 101, ETD 110, ETD 118, ETD 128, ETD 198, ETD 230, ETD 238, ETD 245, ETD 270, ETD 278, ETD 280, ETD 291 CAT 218, COM 211, ENG 111, ENG 112 | ASSESSED IN FY 09-10 | Faculty and Advisory Committee assessment of ETD 278 Capstone CourseCore competency survey at the time of graduationGraduate Exit InterviewsEmployer SurveysFaculty review of student comments from course evaluations |
| **2)** Organize and Manage: As an interdisciplinary team member empowered to develop products, processes, solve problems, project planning, time estimates, ethics, and make sound decisions. | COM 211, OPT 105, ETD 118, ETD 101, ETD 102, ETD 110, ETD 238, ETD 270, ETD 278, CAT 218, EGR 128 |  | Faculty and Advisory Committee assessment of ETD 278 Capstone CourseCore competency survey at the time of graduationGraduate Exit InterviewsEmployer SurveysFaculty review of student comments from course evaluations |
| **3)** Design in detail individual parts from functional sketches provided by an engineer, and model them using a three-dimensional parametric modeler. (i.e. 3D CAD). | OPT 101, MAT 131, MAT 132, PHY 131, PHY 132, ETD 101, ETD 110, ETD 118, ETD 213, ETD 222, ETD 230, ETD 238, ETD 245, ETD 270, ETD 278, CAT 218 |  | Faculty and Advisory Committee assessment of ETD 278 Capstone CourseCore competency survey at the time of graduationGraduate Exit InterviewsEmployer SurveysFaculty review of student comments from course evaluations |
| **4)** Analyze parts for important product properties: Use mathematical and scientific skills to analyze product properties including form, function, fit, strength, thermal, fluid, etc. | OPT 101, OPT 201, INT 113, HVA 286, MAT 131, MAT 132, PHY 131, PHY 132, ETD 101 ETD 102, ETD 110, ETD 118,ETD 132, ETD 213, ETD 214, ETD 222, ETD 230, ETD 245, ETD 238, ETD 261, ETD 278, ETD 291 CAT 218 |  | Faculty and Advisory Committee assessment of ETD 278 Capstone CourseCore competency survey at the time of graduationGraduate Exit InterviewsEmployer SurveysFaculty review of student comments from course evaluations |
| **5)** Desk-top manufacturing of models, or patterns using solid model data as input to drive rapid prototyping or N/C machining equipment. | ETD 128, ETD 110, ETD 228, ETD 238, ETD 278, CAT 218 |  | Faculty and Advisory Committee assessment of ETD 278 Capstone CourseCore competency survey at the time of graduationGraduate Exit InterviewsEmployer SurveysFaculty review of student comments from course evaluations |
| **6)** Document the product/process model using appropriate means. (multi-view drawings, pictorials, catalog/manual illustrations, charts/graphs, shaded image, animation, etc.). | ETD 128, ETD 280, ETD 101, ETD 102, ETD 230, ETD 245, ETD 258, ETD 110, ETD 238, ETD 291, ETD 270, ETD 278, EET 198, EGR 128 |  | Faculty and Advisory Committee assessment of ETD 278 Capstone CourseCore competency survey at the time of graduationGraduate Exit InterviewsEmployer SurveysFaculty review of student comments from course evaluations |
| **7)** Recognize professional, ethical and societal responsibilities, respect diversity and commit to lifelong learning. | ETD 101, ETD 110, ETD 118, ETD 121, ETD 128, ETD 278, CAT 218, COM 211, SOC ELET, HUM ELET | ASSESSED IN FY 09-10 | Faculty and Advisory Committee assessment of ETD 278 Capstone CourseCore competency survey at the time of graduationGraduate Exit InterviewsEmployer SurveysFaculty review of student comments from course evaluations |

1. For the assessment methods listed in the table above, what were the results?

Organize and Manage: Students have consistently improved in their management of the tasks involved in the capstone project. We attribute this to their experience managing a small project in ETD 110 and their continued maturing as students.

Document the product/process model using appropriate means. Drawings and calculations for the capstone course have been extremely well-documented and were positively received by the Advisory members judging their work.

1. Were changes planned as a result of the data? If so, what were those changes?

No changes were required.

1. How will you determine whether those changes had an impact?

No changes were required.

 Starting with next year’s Annual Update, this section will ask about assessment of general education outcomes. For FY 2012-13, you will be asked how the department is assessing Oral Communication and Written Communication in your courses, and in addition you will be asked to share the results of those assessments. Please be prepared to address this in next year’s Annual Update.

d) Does your department have courses where there are common assignments or exams across all sections of the course? If so, please list those courses, and indicate whether you are currently examining results across all sections of those courses.

We do not have common assignments and exams across sections of the courses.

**Section IV: Improvement Efforts for the Fiscal Year**

1. **FY 10-11:** What other improvement efforts did the department make in FY 10-11?  How successful were these efforts?  What further efforts need to be made? If your department didn’t make improvement efforts during the fiscal year, discuss the strengths and weaknesses of the department over the last year and how the department plans to address them in the coming year.

The department developed our plan for the semester conversion, worked to combine classes based on our outcomes and worked within the transfer agreement for our students to the University of Dayton.

We were reviewed by our external accreditation body TAC-ABET, resulting full accreditation for 6 years.

We have added more survey touch points by doing exit interviews with graduating students.

An online statics book was developed, sponsored by a State of Ohio through an OLI grant.

1. **FY 11-12:** What improvement efforts does the department have planned for FY 11-12? How will you know whether you have been successful?

Addition of examples in the statics textbook, as well as “just-in-time” links for help on the math required to solve problems of the type being worked.

Adding an introductory engineering math class through a grant project with Wright State University to improve student success in statics, physics and math intensive applied engineering technology classes. There is an assessment plan to measure and track the statics class success rate to determine if this project makes an impact in student success. A follow-on grant has been requested to implement additional tutoring and recitation section support for upper-level mechanical engineering and engineering technology classes, including Statics, Dynamics, Strength of Materials, Thermodynamics, Fluid Mechanics and Machine Design.

Questions regarding completion of the Annual Update? Please contact the Director of Curriculum and Assessment at 512-2789 to schedule a time to review the template and ask any questions.