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

**Program:** Computer Aided Manufacturing

**Section I: Trend Data**

1. **Program Trend Data**

The Program names changed in 2007 from some version of Tooling and Machining Technology to Computer Aided Technology, with options. From Fall of 2008 to Fall of 2011 the enrollment has been:

|  |  |  |  |
| --- | --- | --- | --- |
| 2008 | 2009 | 2010 | 2011 |
| 286 | 309 | 235 | 212 |

**The graduation numbers for both degrees and certificates have been**:

|  |  |  |  |
| --- | --- | --- | --- |
|  | 08-09 | 09-10 | 10-11 |
| Degrees | 10 | 23 | 13 |
| Certificates | 40 | 68 | 30 |
| STEP II\* | **29** | **37** | **10** |
| Short term | 7 | 25 | 24 |
| Total degrees/Certificates | **57** | **116** | **67** |

* STEP II included in certificates, broken out to show impact

**STEP II Students placed in Jobs after graduation**

|  |  |  |  |
| --- | --- | --- | --- |
| 2007-8 | 2008-9 | 2009-10 | 2010-11 |
| 11\* | 17\* | 10\* | 9 |

* Includes 14 Displaced workers across these three years
* Demand for STEP II and CNC grads from a recent survey was 40-50 people needed immediately, with another 50-100 over the next several years
* Does not include students that already had jobs.

**Course Success rate**

|  |  |  |  |
| --- | --- | --- | --- |
| Course number | FY 2008-09 | FY2009-10 | FY 2010-11 |
| INT 107 | XXX | 35.4% | 43.9% |
| INT 109 | 72.7% | 70.4% | 64.2% |
| INT 113 | 78.2% | 78.4% | 65.1% |
| INT 114 | 51.7% | 52.9% | 43.8% |
| INT 116 | 100% | 85.5% | 74.7% |
| INT 141 | 84.3% | 73.4% | 76.1% |
| INT 142 | 84.1% | 78.8% | 80% |
| INT 143 | 92% | 94.4% | 85.2% |
| INT 145 | 73.5% | 87.9% | 66.7% |
| INT 161 | 78.4% | 54.0% | 67.7% |
| INT 162 | 86.7% | 78.3% | 61.9% |
| INT 163 | 87.1% | 100.0% | 87.5% |
| INT 204 | 89.7% | 82.1% | 84.9% |
| INT 211 | 95.2% | 81.6% | 73.2% |
| INT 212 | 87.0% | 75.0% | 83.7% |
| INT 213 | 100.0% | 90.0% | 100.0% |
| INT 225 | 71.4% | 73.9% | 80.0% |
| INT 270 | 94.6% | 100.0% | 83.3% |
| INT 297 | 88.9% | 100.0% | 90.0% |
|  |  |  |  |
| Total INT | 81.2% | 75.1% | 69.8% |

* Key courses or series that act as “gatekeepers” for the program

1. **Interpretation and Analysis of Trend Data**

Looking at the trend data above we are caught in a real dichotomy of the current economy. The trend for enrollment in the Program (including degrees and certificates) has been steadily declining in the face of increased demand for students who possess the skills that the degrees and certificates provide. There was an increase in the number of graduates in 2009-2010 which coincided with the displaced worker program, but the numbers have dropped off since. Employers are telling us they cannot find enough skilled employees, but this has not translated into an increased demand in the program. The jobs we are talking about range from $10 per hour at a low level entry job, all the way up to $45+ per hour for CNC programmers. The demand outpaces the supply. We are working closely with employers in the Dayton and Cincinnati areas, High schools that offer machining programs and areas like the Job Center where people come to look for job opportunities .When we look at student success rates for the last three years we are also seeing a downward trend. This speaks to the fact that we are attracting people into the program but we do not screen applicants for certain skill sets. Not everyone can be a machinist. We have had several focus group meetings with employers to try to come up with a recruiting strategy and that strategy includes the possibility of some kind of testing. We do test and screen candidates for the STEP II Co-op program. The consensus is that we have a well respected, diversified Program, which provides excellent graduates for the workforce. The major challenge now is how do we increase our enrollment to match the current and anticipated demand. To meet that challenge we have done (and are doing) the following:

* Working on increasing the Advertising of the program (including degrees and certificates) with Sinclair’s Marketing department. Currently Sinclair does not market individual programs, but we are looking at ways to get the word about our Machining program to the general public. This includes newspaper articles, development of a new Brochure and possibly creating a marketing video that could be placed on Youtube or other social media.
* Working with Sharma Fox in Academic Services to develop an in-house screening test, which would identify strong candidates for the machining program.
* Looking at modifying the CNC Short term certificate so it could be completed in two quarters. This would be coupled with a work-study program with our industry partners which would have students going to class for ½ day and working the other ½ day.
* Conducting more machining classes at local high schools or making better connections through Tech Prep to encourage those high School graduates to continue their education at Sinclair. We are currently offering classes at Ponitz Career Academy, Mound Street Academy and looking to start at Belmont HS. We are working with Miami Valley CTC and Stebbins High Schools to give their tech prep students articulation credits or allow them to “test out” of certain courses based on what they have taken in high school
* We are continuing to Host the Regional SKILLS USA machining contest and for the second straight year host the SKILLS USA statewide contest for manual machining and looking to host the CNC contest. This gives great exposure to our program statewide.
* We have worked with Academic advising so that our STEP II coordinator will do all the advising and scheduling for our STEP II students. This is in addition to hosting several “information sessions” about STEP II and taking prospective students and parents on tours of our facilities (basically a one on one recruiting session).
* Working closely with the DRMA (Dayton Region Manufacturing Association (Formerly the DTMA) to recruit current workers to enhance their skills. This is where there are some problems since most employers now have their employees working more than 40 hours per week which leaves them no time for school.
* Hosted the regional HTEC (HAAS Technical Educators Conference). Worked with machining educators (High school, business, and college) on exchanging ideas to increase enrollment. All are faced with the same challenge we are, decreasing enrollment. We continue to have a dialog with participants.
* The key courses in the INT Program are highlighted in yellow. The success rates of these courses lead to more detailed analysis of the content. INT 107 and 109 are introductory courses that are taken by students other than INT. INT 107 is basic print reading and drawing interpretation. Without this skill a person has no chance of becoming a machinist. We are evaluating some of the activities to help make the material clearer to the students without sacrificing proficiency.
* The INT 161,162,163 series is key for the STEP II program. Typically we measure the number of students who start in INT 161 with the number who successfully complete INT 163. This is indicative of how the students succeed in STEP II. Currently we are around 50%. We would like to see that number be higher, but we feel it reflects non-pre-testing of our students.
* INT 213 is the capstone course for the CNC degree. That runs close to 100% and we feel it is indicative of the students in the program. Typically, STEP II is for people entering the trade, while CNC is for people who have had some experience. We feel that is indicated in the success rates.

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

1. What was the fiscal year of the most recent Program Review for this program? The most recent Program review was 2008-2009.
2. 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”)?

The goals listed in section E of the most recent review were:

* Distance Learning: The CAM department is exploring distance learning opportunities for some of its manufacturing courses. It may be possible to incorporate some web material from HAAS Automation. Course enhancements and hybrids are being considered as well as full web courses. We are using a grant on “Virtual HAAS” from the CTL where a student using internet access from anywhere, can access the program and develop and virtually run a HAAS Mill or Lathe. This program can be later downloaded to a machine to actually make a part.
* 4 and 5 Axis machining: The new HAAS CNC machines give us the added capability of 4 and 5 axis programming and machining. The CAM department is incorporating this technology as we go to semesters.
* Tabletop Simulators: Our new HAAS tabletop control simulators may allow us to offer CNC Programming in different locations.
* Bio-Manufacturing- we will explore opportunities in the emerging fields of bio-manufacturing and medical devices. The 4 and 5 axis Mills allow for the manufacture of medical devices.

1. What Recommendations for Action were made by the review team to the most recent Program Review? What progress has been made towards meeting these recommendations in the past year?

**Recommendations for Action**:

* The department could consider developing additional methods of recruiting students, including use of the web-site and possibly forming partnerships with career technical programs.
  + We have not yet fully utilized the web to recruit students, but that is part of our plan for the future, particularly current High School students. As mentioned, we are working more closely with Tech Prep to reach out to schools that we have not in the past. As mentioned above, we are looking at redesigning the CNC short term certificate and coupling that with a “work-study’ program supported by local industry partners. We are working with Miami Valley CTC, Ponitz, Mound Street Academy, Stebbins and Belmont high schools to expand our offerings or accept more of their course credits.
* There is a need to build adjunct faculty ranks to manage projected enrollment growth, and the department should develop strategies that will facilitate this process.
  + We participated in a career fair with Jennifer Kostic and recruited several new, very competent individuals who have been added to the Adjunct ranks and have been teaching for the last year with very favorable results. We required all new candidates to demonstrate their hands-on abilities to our full time faculty and assigned them as mentors, which has created a good pool of adjuncts. The feedback from the students and other faculty about the Adjuncts has been of the highest order. We have had one adjunct faculty member get heavily involved with the DRMA “BOTS” program. He is tying it to the courses he teaches at Ponitz. We are hoping to expand this activity to other schools.
* If there is a threat posed by emerging competition from for-profit organizations and career technology centers, the department should seek ways to publicly differentiate the Sinclair program and what it has to offer from others.
  + The two major ways we differentiated ourselves from the competition was by our involvement with HAAS as a certified HAAS Tech Center (one of only 2 in the State of Ohio) and we created a short term CNC Certificate to upgrade skills of current workers. Unfortunately, HAAS has ended their support of the HAAS Tech centers, but we did purchase the three HAAAS Vertical Mills to continue with the Program.
  + We have instituted a Co-op program for STEP II participants. They volunteer and take a test to qualify for the Co-op program, and we find employers willing to hire them for 10 weeks. They need to do the interviewing and get the positions. This extends the STEPII certificate for 1 extra quarter, but the results have been very positive.
  + We are working to carry this over into semesters.
* The faculty is encouraged to consider alternative delivery strategies, e.g. non-credit courses and short-term certificates, to meet the community’s need for workforce development and to plan future approaches to meeting needs related to new applications in areas such as bio-manufacturing and manufacturing of medical devices.
  + We are offering a short term CNC Certificate as mentioned above, and are trying to find ways to shorten the time required with a work-study program.
  + We have been working with Workforce development to provide non-credit training to local companies.
  + We have had faculty trained in 4 and 5 axis programming on HAAS Vertical Machining Centers to expand our capabilities in the Bio-medical field.
* While it is clear that excellent learning experiences designed to facilitate the achievement of general education outcomes as well as program outcomes are in place, there is no documented evidence that those outcomes are being met. If needed, support is available through the College-Wide Assessment Committee to design methods for collecting, analyzing, and documenting data regarding these outcomes.
  + Based on these recommendations, we have been capturing data on student performance in various classes and as part of the Q2S conversion, revisiting our Program outcomes. We are still not where we would like to be on data collection and analysis, but we are working on it. We have indentified those outcomes in our Q2S transition and will use whatever means are available to capture this data. Many of these Gen-ed outcomes are what are companies are calling “soft-skills”. They are indicating that many of their employees lack these skills, so we are looking to place a greater emphasis on them in the new Q2S degrees and certificates.

1. Have these goals changed since your last Program Review Self-Study?  If so, please describe the changes.

The goals have stayed pretty much the same but have been influenced by our conversion to Semesters. The challenge: How to attain our goals when as we make the conversion. The conversion is compete and we feel that we have addressed the goals in our new curricula for degrees and certificates.

1. What progress has been made toward meeting any of the goals listed above in the past year?

We are offering INT 141 as a Web class. We have applied for and received a CTL grant for “Virtual Haas” through Immersive Technologies, which will allow students to program and “virtually” run a HAAS Mill from any computer that has Internet access. We have been having trouble getting this “off the ground” due to some technical glitches, but are working through them Fall and Winter terms.

The faculty has been trained in 4 and 5 axis machining and it has been incorporated into the semester course design. We worked on obtaining a Swiss Machining Center through a DOL grant that would have expanded our capabilities in the bio-manufacturing area. Unfortunately, we did not receive the grant. We are working with some local companies, exploring use of their equipment to conduct specialized courses (Gosiger, Metalex).

We are now offering CNC programming at Ponitz Career Center, but initial analysis shows many students not prepared to take this course, even though we have the capability of offering it.

**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**.

|  |  |  |  |
| --- | --- | --- | --- |
| **Computer Aided Manufacturing**  Program Outcomes | In which courses are these program outcomes addressed? | Which of these program outcomes were assessed during the last fiscal year? | Assessment Methods  Used |
| **1)** Demonstrate technical engineering skills. | INT 109,113,114,211,212,213,225 |  | * Simulations * Performance appraisals |
| **2)** Analyze manufacturing problems. | INT 211,OPT 205,206 |  | * Simulations * Performance appraisals * Exams |
| **3)** Math skills. | INT 141,142,143,MAT 101,131 |  | * Exams |
| **4)** Computer competency. | INT 113,114, ETD 198, ETD 199 |  | * Exams * Simulations |
| **5)** Positive work habits. | INT 161,162,163, 213, OPT 126 |  | * Performance appraisals |
| **6)** Professionalism. | INT 161,162,163,213 |  | * Performance appraisals |
| **7)** Machining competencies. | INT 107, 109,161,162,163, 113,211,212,213 |  | * Performance appraisals |
| **8)** Lifelong learning. | INT 213,OPT 205, 206 |  | * Exams * Performance appraisals * Employer feedback |

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

For Outcomes #5 and #6 the INT 161-163 series played a large role in both positive work habits and professionalism. These courses run from 8 to 5 two days a week and simulate the working environment. Positive work habits and professionalism go hand-in hand. They are measured by how a student conducts themselves during the course, attendance and tardiness, all of which impact the grade, from a reduction in grade all the way to failure for two unexcused absences. This past year 71% of the students in INT 161 scored a 70% or better on these categories and 66.7% in INT 162. In 163, 100% of the students had a 70% or better.

INT 213 the capstone class, had 100% of the students score above 80% in these categories, and OPT 126 Supervision had 80% of the students have 80% or better in these areas. This would seem to indicate that our students understand the importance of these outcomes in their careers and this is also backed up by employers who rank our graduates well above average in these areas. These results are determined by face to face interviews with employers by our STEPII Co-ordinator , Co-op coordinator and Department Chair.

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

While we would like to see a higher success rate, and make sure our students are as best prepared as they can be, based on the results we have not instituted any major changes for this FY, however, we have added some changes as we head into semesters. SCC1101 will be required for all degree programs and the STEP II certificate. We are talking about adding some interviewing and resume writing skills someplace in the curriculum, possibly in the Capstone class for CNC and the Co-op class for STEP II. One idea was to have an industry partner conduct mock interviews and give feedback to the students. This is under investigation. The biggest item is having the STEP II coordinator and Co-op coordinator visit employers who have hired co-op students, interns, or full-time employees and getting their feedback as to how our students are doing in these areas.

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

By using the same data analysis and see if the numbers increase. Our goal is to have 100% of our students be competent in these areas. 100% is probably an unrealistic expectation, but it is something to strive for.

1. 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.
2. 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.

INT 107, INT 109,INT 141-143 generally have common assignments across all sections. These are taught by the same instructor or limited number of instructors and monitored by the course co-ordinator for consistency. If there appears to be any wide discrepancies, these are discussed in departmental meetings. Our program necessitates that all students do pretty much the same assignments in all classes and we strive for consistency among instructors. Usually, we have an instructor who has not taught a particular course, sit through the course with the course co-ordinator, who then mentors the new instructor. This is particularly true for adjunct instructors.

**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.

We increased recruiting efforts, tried to strengthen our relationship with Workforce Development and get more involved with the DRMA BOTS program. We are still evaluating the results of our efforts, but we know that recruiting is number one priority, followed closely by maintaining our technological advantage over potential competitors. We have installed a new Prototrak Lathe in our manual machining lab. This lathe is programmable and will be an asset to our STEP II students and help them migrate into the CNC program. We purchased the three HAAS Vertical Machining Centers to continue with our dominance in this area. Our biggest accomplishment was redesigning the degrees and certificates for Semesters. We have been listening to our Advisors and trying to add more soft-skills wherever possible. This includes adding some OPT classes which provide many of the skills employers are looking for in the general workforce.

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?

Changing the Degrees and certificates to meet Semester requirements. This entailed looking at every class we teach, combining those that made sense, eliminating ones that didn’t and trying to meet Sinclair and OBR guidelines. We added some new prerequisites and new courses to help our students be more successful (SCC 1101, MET 1131, OPT 2240 for example).

Recruiting, recruiting, recruiting! If we can’t get students, the program will die. We are working with Rebecca Butler to get more advertising, have developed a new brochure and are working on a new marketing strategy. In addition, our visits to high Schools and businesses will increase as will our involvement with DRMA. We also are focusing on the Virtual HAAS and have kept our HAAS Vertical Machining Centers, now that HAAS has abandoned the HAAS Tech Center approach.

We are looking to expand part of our Program into Warren County and Preble County if feasible, to supplement, not replace current students and are looking for more opportunities with Workforce development.

If our enrollment hits projections and our students find employment, we will have been successful.

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.