**Sinclair Community College - Continuous Improvement Annual Update 2010-11**

**Program:** Operations Technology

**Section I: Trend Data**

1. **Program Trend Data**

The Program name changed in 2007 from Industrial Engineering Technology/ Quality Engineering Technology to Operations Technology with an Industrial Engineering Technology Option, and a Manufacturing Option. The Base OPT and the Industrial Engineering Option underwent accreditation from TAC/ABET in Fall 2010.From Fall of 2005 to Fall of 2010 the enrollment has been:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| 136 | 165 | 180 | 165 | 128 | 106 |

The graduation numbers for both degrees and certificates have been:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 05-06 | 06-07 | 07-08 | 08-09 | 09-10 |
| Degrees | 13 | 16 | 30 | 32 | 16 |
| Certificates | 0 | 3 | 12 | 44 | 18 |
| Total degrees/Certificates | **13** | **19** | **42** | **76** | **34** |

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

Looking at the data, the enrollment trend was increasing until 2007 when it dipped precipitously to the 2006 level and has continued to fall. In light of the current school enrollment, it is a disappointment, especially in the light of the fact that the demands for graduates with the skills we provide has been increasing. The general economic trend in the Miami Valley can be attributed to some of this problem (bankruptcies by GM and Delphi have placed a lot of people in the ranks of the unemployed and many of those are reluctant to enter a similar field). They are also discouraged to do so by talking to friends and relatives. While this may appear to be a problem, we view it as an opportunity. Some of the reasons for the decline can be attributed to lack of advertising directed at high school students, and the ability to teach courses in the local Tech Prep High Schools, which was caused by the introduction of Project Lead the Way. We originally felt that this would be a strong opportunity for our Program, but the opposite has happened. PLTW has lessened the amount of class time students have to take extra course work, and has decreased the number of classes that we offered to local High Schools connected with Tech Prep. Also, we feel that the name switch in 2007 may also be part of the problem. Many people are unfamiliar with the OPT field, what it entails, and the types of jobs available. To address some of these issues we have made a concentrated effort to recruit more students into the program by:

* Increasing advertising using Sinclair’s resources and working with the DTMA (Dayton Tooling and Manufacturing Association) in their BOTS Program.
* Visiting local companies and schools
* Participating in college fairs at local high schools.
* Working more closely with the Tech Prep office to increase our presence in schools we are not currently participating with.
* Trying to get some OPT classes offered at Course view Campus.

The trend in graduates, both degree and certificates, had been increasing, but also fell off corresponding to the enrollment decline. This is not as bothersome, because many of our students are not seeking degrees or certificates, but specialized education on specific topics that may make them more “employable”. We have had numerous people who enroll for just a few courses, and we are looking to capitalize on that by offering some more short term certificates. We look at student success rates as provided in Dawn. Since 2007 we have only had two classes below 70% success rate, OPT 201- Statistical Process Control, which has been around 60%, and OPT 251 – Supply Chain Operation and Logistics which was 67%. This was investigated and found that the students were not properly prepared in OPT 101 for the statistics base needed in OPT 201. Both professors got together and modifications were made to OPT 101, tutors were provided for OPT 201. We will continue to monitor the results as we go forward.

The other course below 70% was OPT 251 – Supply Chain Operation and Logistics. This is a brand new course that was developed jointly with the Management Department and the data available is for only 1 section, too limited to make any decisions other than to keep monitoring it. This course was created with Q2S in mind, as it was built as a 5 quarter hour course that will convert directly to a 3 semester hour course. It is also designed to run as a web based offering, so we can offer it face to face, or web.

**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 2004-2005 Since that time (2007) the IET/QET Program were renamed the Operations Technology Department with Industrial Engineering Technology and Manufacturing Options.

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”)?

The top priority of the (at that time) IET/QET department is our strategic and long range planning initiative. This is an ongoing process that will produce a conceptual plan by the end of this academic year (2004-05) and a detailed plan in the fall. With manufacturing employment declining in the Dayton area, it is critical that we re-engineer our department soon. With careful direction from our advisory committee, we are determined to achieve the following goals for expanding and improving student learning:

1) Continue to support the changing needs of local manufacturers, and

2) Find new opportunities (non-manufacturing) for the IET/QET skill set.

To accomplish these goals, we are actively pursuing the following:

New Program for Non-Manufacturing Applications: We are strongly considering a new program, option, or track (or revising a current one) to support non-manufacturing applications of IET/QET skills. Some new courses would be required, also. Purdue University’s College of Technology has an interesting model for such a program. We have met with Purdue faculty and administrators to better understand their program.

Business/Industry Market Penetration: In general, local employers don’t know how to best take advantage of the IET/QET department. We need to help them understand that we’re more than just associate degrees and we’re more than just manufacturing. We are currently developing pamphlets for high-interest courses to be distributed to local employers in a mass mailing this summer.

Certificates: We are continuing to consider additional certificate programs (consisting of existing courses) to appeal to more focused needs than associate degrees.

Additional Articulation Agreements: Students tell us that articulation agreements with 4-year colleges and universities make our associate degree programs more attractive. We already have active articulation agreements with the University of Dayton, Purdue-Richmond and Central State but our students still want more options. We will establish new articulation agreements and develop new methods of advertising.

Warren County: We see expansion into Warren County as a growth opportunity in general, and specifically for the area quality certifications. Recently, Cincinnati State decided to discontinue their quality program. There are many practicing professionals in the Cincinnati area who need refresher courses for various certifications offered by the American Society of Quality. We will offer those courses in Warren County starting this fall.

Distributed Hybrid: As mentioned previously, the Distributed Hybrid project features the exploration of an alternative approach to curriculum delivery in QET (a concept that has the potential to increase enrollment and average class size). This concept could certainly be applied beyond QET, and is therefore being watched closely by our division and by the National Science Foundation.

Saturday School: Based on student feedback, the IET/QET department will be offering "Saturday school" laboratory sections based on a combination of the Distributed Hybrid concept and Antioch's McGregor Adult Saturday Program Model.

Project Lead The Way: We have been working with Tech Prep programs in high schools for many years, but the new Project Lead The Way initiative represents a real growth opportunity.

Six Sigma Black Belt: Six Sigma Black Belt refers to an advanced level of certification for a Six Sigma quality professional. Based on the lessons learned from our first offering of a Six Sigma Black Belt Exam Preparation course in winter of 2005, we are rethinking the course’s prerequisite structure. The course needs more prerequisites in order for students to be successful.

Three years ago, the faculty in what was the Industrial Engineering Technology (IET) Department and is now the OPT Department and the Sinclair Community College administration planned and completed a major improvement in our curriculum. At that time, the IET program merged with the Quality Engineering Technology (QET) program. The faculty had long recognized that persons with IET/QET education, while primarily employed in manufacturing positions and organizations, have career opportunities in many other industries. People with IET/QET education are employed in a wide range of positions in healthcare, logistics and distribution, retail, government, entertainment and other non-manufacturing industries.

In order to improve and broaden the career opportunities for our graduates many improvements were made to our curriculum. It has been long recognized that a person with IET/QET skills can be a valuable employee in a wide range of industries and companies, not just in manufacturing. The main problem is that most students and potential employees see the word “Industrial” in a person’s degree or title and automatically assume that they can only be of use in a manufacturing industry and company. The objective of the implementing a program titled “Operations Technology” was to broaden the understanding of students and employers to better understand that the types of skills taught in our OPT and OPTIO courses and degree options can be used in all types of industries, organizations and companies. While making these changes we will continue to provide a manufacturing related career path to also provide students who wish to enter that industry with IET/QET skills that will enhance their ability to do so. As a result we now have a new core program, Operations Technology, but have at the same time retained and improved the Industrial Engineering Technology program under the OPTIO option, and also added the Manufacturing Option so as not to abandon that particular segment.

As part of this improvement effort there were many similar programs reviewed at other colleges. Making the transition to OPT, we studied the Industrial and Manufacturing Engineering Technology programs at the University of Dayton (especially for the IET Option), but most of our benchmarking occurred with the Organizational Leadership and Supervision (OLS) program at Purdue University. The OLS program had the unique combination of Industrial and Quality Technologies that we were looking for. Purdue’s OLS program resides in their College of Technology, so we thought that our new program would fit well in Sinclair’s Science, Math and Engineering Division. During the benchmarking process, we worked closely with the Purdue’s Richmond campus, only an hour drive from Dayton.

The OPT Program has been offered at Sinclair since the Fall, 2007 quarter and is now seeking accreditation under the general criteria for TAC of ABET. At a high level, the programs’ objectives are very much in line with the stated objectives of the program criteria, including the preparation of associate degree graduates for either immediate employment in the field or for related baccalaureate studies.

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 how we were implementing the nine approaches listed above. Of the nine, the new OPT Program has been initiated, we are still struggling with Business/Industry market penetration but have made that a major focus for recruiting. We have initiated some new certificates and are working with local colleges/universities to expand articulation. We have attempted to offer some courses at Course view in Warren County without much success. We are still working hard on this item. The Distributed Hybrid, Saturday school and Project Lead the Way all have been worked on but with limited if any impact or results. The Six Sigma course has been added to the Program and has proved to be very successful and well received by students and industry. So we will focus on the same goals, but try different approaches.

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

In the past year, most of the activities focused on four areas:

* Implementing the Engineering Technology Core Curriculum
* Preparing for and gaining the TAC/ABET accreditation
* Working on the conversion to semesters.
* Expanding our involvement with non-manufacturing enterprises

The Core curriculum has been implemented with the blessing of our Advisory Committee, we have had our accreditation evaluation (and addressed this below). The Q2S was done keeping our goals in mind as we reviewed and revised the curriculum, and we have added Service Learning component to several classes and have more involvement with non-manufacturing enterprises on our Advisory committee and in our Capstone classes.

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?

Increase enrollment in the programs.

* Develop course-level performance criteria for QET and IET courses; include them in CMT.
* Provide evidence of student learning
* Secure a higher response rate from graduates to facilitate research on student perceptions’ of the educational experience.
* Confirm/quantify the demand for continuous improvement skills outside the manufacturing area prior to course or program implementation.
* Explore continuous improvement content and expertise in other programs at Sinclair as new program directions are considered.
* Solicit the active promotion and marketing of the programs by the employers who support the program.
* Ensure that grant-related activities align with and sustain/promote the long-term plan for the future development of the program.

Most of these areas were addressed in our accreditation visit and report and the responses are listed below:

1. **Program Weaknesses**

1. Criterion: Criterion 4. Continuous Improvement states, “The program must use a documented process incorporating relevant data to regularly assess its program educational objectives and program outcomes, and to evaluate the extent to which they are being met. The results of these evaluations of program educational objectives and program outcomes must be used to effect continuous improvement of the program through a documented plan.” The program has five program outcomes and are mapped to Criterion3 attributes [a] through [k]. Although the assessment process relies on student examination grades and project grades, there is not clear connection between those grades and the attainment of each outcome. Therefore, the data are not effective in measuring the extent to which program outcomes are being attained. There is no clear baseline against which the attainment of outcomes is being measured, so the program is unable to design, implement, and/or determine the effects of its efforts to improve program outcomes or the attributes of Criterion 3. Therefore, the program must demonstrate (1) that it is using a documented process incorporating relevant data to regularly assess its program outcomes and to evaluate the extent to which they are being met, and (2) that the results from evaluations of program outcomes are being used to effect program improvement.

Response:

PROGRAM OUTCOME MATRIX

The Operations Technology department utilizes the Program Outcome Matrix (known internally as “Form B”) to systematically identify and link the program outcomes, the program curricular strategies (identifying the courses where students get an opportunity to learn, practice and/or demonstrate the outcome), the ABET a-k competencies, and the program assessment methods (identifying the data collected to evaluate student performance and assess program effectiveness). Assessment methods include written surveys, archival records, portfolio/project appraisals, and locally developed exams. Overall, this matrix is a tool to map connections and define the common expectations of the courses in the OPT programs.

On the Matrix we have shown linkages to program outcomes and Criterion 3 in much more detail than we presented during the visit. We have created a written survey for the students in the capstone class to assess their learning, we have created rubrics to use on noted outcomes/criteria that explain the linkages, and have tied specific exam questions to specific outcomes. We have created a summary sheet for each of our classes that will be filled out by the instructor each quarter, and summarized by the department chairperson yearly and reviewed with the faculty at the departmental meeting to discuss, implement, and measure any changes made to the course(s). Samples of these items that have been collected from courses run during the Fall 2010 quarter include:

* Data from the OPT 125 exams for Program outcome #3 Quality and ABET criteria a,b,c,and k, and also the number of students who took the final exam and scored 80% or better on questions #’s 3 & 6.
* The number of students who scored 80% or better on the final exam in OPT 201.
* Also, we are measuring the number of students who were awarded Six Sigma Greenbelt certificate in OPT 240. These results are indicative of what we are and will continue to measure to assess out Program and use to make continuous improvement. For OPT 240 (Six Sigma) 28 students took the course, 26 got 80% or better as a class average and all 26 received the Green Belt Certificate. We will continue to monitor data such as this to review on a regular basis with the entire departmental faculty and use it to guide our decisions as far as continuous improvement activities are concerned. We will also be sharing this information with our Advisory Council

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* For OPT 130 (Lean Operations) 16 out of 16 students received a 4 or higher on the evaluation rubric items C and G, 100% of the students passed the course, 94% with a “B” or higher.

The key to all this data collection is to monitor it over time and look for trends. We, as a department, did not do as much of this in the past as we could have, certainly not at the level demanded by ABET. The ABET evaluation has opened our eyes to the need for detailed data over time to make informed decisions about the direction of the Program and student success.

Criterion: Criterion 9.

Program Criteria states,”…graduates must demonstrate the ability to accomplish the integration of systems using appropriate analytical, computational, and application practices and procedures”. While the program has a capstone course that might provide an environment for students to integrate systems, there was no evidence that the ability to integrate systems was being assessed. Therefore, the program has no way to reliably and consistently determine if its graduates are being provided the level of ability in systems integration that is needed to meet the needs of potential employers. Therefore, the program must demonstrate that its graduates are being provided the ability to integrate systems using appropriate analytical, computational, and application practices and procedures.

Response:

**OPT Rubrics – Systems Integration**

A series of rubrics used to evaluate the student performance on several classes has been developed and modified to include evaluation on “Systems Integration” to meet the IIE requirements in this area. The rubrics are attached and for assessment purposes the data collected from each class each quarter will be summarized by the instructor and passed on to the Department Chairperson who will aggregate the results and plot over time. This data will be reviewed yearly by the department faculty and the Advisory Committee to see if any changes need to be made to the projects to insure student ability to demonstrate proficiency in this area. We will keep track of number of students who took this course and the number and percentage who achieved a score of 4 or higher on the rubric on this item (Systems Integration). This rubric will be used initially on the following courses:

OPT 125 World Class Operations

OPT 130 Lean Operations

OPT 206 Value Analysis

OPT 278 Capstone

Data has been collected using the rubric for the OPT 130 (Lean) course during Fall quarter, and is being used on the rest of the above courses this current quarter and will be used in future quarters to collect and analyze data necessary to determine if our students are meeting this criteria. For the Fall 2010 quarter in OPT 130, 16 students took the course and 100% attained a 4 or higher on the rubric. Looking at each of these classes individually to see how Systems Integration occurs:

OPT 125 – Class project is to place students on 4-6 person Teams and the teams must decide whether to build a birdhouse or birdfeeder and for what species of bird. The students then follow the steps of the Product Realization Process (copy attached) and the Project requirements (Attached) to design a part, design a production process, a manufacturing facility and quality control plan and cost breakdown analysis. It cumulates with a formal PowerPoint presentation in which all team members are required to present. This teaches the students at an introductory level what items need to be integrated to be able to bring a product from concept to production. This is the first phase in meeting the IIE’s system integration requirement.

OPT 130 – Class project is to place students on 4 sub-teams (Fabrication, sub-assembly, final assembly and delivery) and produce a product (K’Nex wagon) with 2 designs plus an option on each design for a total of four part numbers that must be produced on random demand to a Takt time that varies from 30 seconds to 2 minutes depending on the number of students in the class.

This lab has devices that simulate production of various wagon components (both load and leave and continuous process equipment) that require tooling and set-up. This area feeds a sub-assembly area based on demand using a pull system of delivery to replace what was used in the previous delivery cycle.

This subassembly area and fabrication area feed a manual Final assembly line(s) that produce the final product. The Final Assembly area pulls parts from the other areas through use of a Kanban system. The four sub-teams have to work together to produce a part to the Takt Time that is generated through a random demand using the least amount of labor, equipment and inventory possible. Each sub-team must create job instructions for every work station and keep and complete Standardized Work Charts. This demonstrates the systems integration principle and allows the students to experience it “hands-on” in a laboratory environment at a higher level than in OPT 125.

OPT 206- The class is placed on 4-6 person teams, and given the cost, design, process and model of a part and their goal is to use the techniques of Value Management, Design for manufacturability and Error Proofing (Pokayoke) improve the current design/process or create a new design/process. The Team has two volumes to work with, 1000 per year and 1,000,000 per year. This allows them several options. At the low volume, they can take the existing design and modify the high cost parts by redesigning them to perform the same function at a lower cost, redesigning the entire assembly to perform the same function at a lower cost and/or look at process redesign to make it more efficient and less costly. At the higher volume, the same above options apply, but they can also choose to keep the design the same and use a different material and process. For example, instead of making it out of wood and processes associated with that material, they may choose to make it out p of plastic and injection mold it. The final presentation must be done on PowerPoint and include original cost and design, and then show for each option, new cost and design along with the process used to manufacture it and any other cost benefits associated with the new designs/processes. A production plan must be developed to show what systems must be integrated to make this happen.

OPT 278 – Capstone Project

In this class students are assigned a project in a for profit company or a Service Learning Opportunity (non-profit). The project is chosen by the management of the company and approved by the instructor. Students are assigned to the project based on project scope and can run from an individual assignment to a group project involving four or more. This project involves the students spending from 8 to 10 hours per week on-site, plus meetings to plan activities outside of work. The scope of the project must be such that it can be completed in 10 weeks and impact the cost or quality of the host company. Since every project is different it is hard to construct anything put general rules and instructions, but the instructor meets with the students weekly to discuss progress and problems. The project cumulates with a formal presentation to the instructor and company management at the company site and a visit to the project site. Besides the instructor completing an evaluation rubric, the company supervisor also completes an evaluation sheet. For assessment purposes, the rubric and evaluation sheet will measure outcomes and specifically “Systems Integration” and keep track of the number of students who demonstrate proficiency in this skill over time.

**Program Concern**

Criterion: Criterion 1. Student states, “The program must evaluate student performance, advise students regarding curricular and career matters, and monitor students’ progress…, The program must also have and enforce procedures to assure that all students meet program requirements.” This is a new program with low enrollment, so courses have not always been offered at times or in the sequences indicated on the program of study. In those instances other available courses have been substituted for the prescribed courses, and those substitutions have been reasonable with regard to course content. However, two transcripts of graduates showed that course substitutions accounted for about 30 percent of the required courses. When substitutions were used for required courses, it was noted on the degree audits for the affected students. While the academic advisor can revise the program of study by allowing students to make course substitutions, there is no formal process for the approval and documentation of such substitutions, there are no check points in its audit process to verify student progress in mandatory courses, and there are no pre-approved lists of appropriate substitutions. Therefore there is a potential for students to take incorrect classes, to inadvertently create audit problems, or to make an excessive number of substitutions, the combination of which could delay graduation or create gaps in critical knowledge or skills. This finding remains a Concern until the program demonstrates that it is advising students regarding curricular matters, and monitor student progress, and enforce procedures to assure that all students meet all program requirements.

SME Course Substitution Process & Graduation Requirements

TAC/ABET Programs

In response to *concerns* for Civil Engineering Technology, Environmental Engineering Technology and Operations Technology programs, where course substitutions were made without remarks, several meetings were held with the Director of Academic Advising and the Registrar. This has resulted in several checkpoints and required approvals by department chairs before any course substitutions and degree audits are approved for graduation. The final graduate list for the TAC/ABET programs is first verified and approved by the respective department chairs and then approved by the SME Division Dean. This will ensure that all accredited programs meet *Criterion 1. Students,* especially with respect to course substitutions, meeting all pre-requisites and number of credit hours required to graduate from the program. All degree audits will have clear notes as to why the substitution, if any, was approved by the chairperson. Program chairs will maintain records of all such approvals.

The two major process changes, SME Course Substitution Process and Graduation Requirement Process, are in place to meet program requirements, *Criterion 1. Students*, for all TAC/ABET accredited programs effective January 1, 2011. These processes will be reviewed on an annual basis for continuous improvement.

**1. SME Course Substitution Process:**

1. Advisor meets with student and completes SME Course Substitution Form.

2. Advisor sends *Course Substitution Form* to Department Chairperson for approval.

3. Department Chairperson reviews.

c. If the substitution is approved, the Department Chairperson sends a copy of the form back to the Advisor. The original form is retained by the department office.

d. If the substitution is not approved, the Department Chairperson calls the Advisor. The Advisor will notify the student of the decision.

**NOTE: Department Chairperson can initiate the SME Course Substitution Form and send to Advisor to make the appropriate adjustment.**

4. For approved substitutions, the Advisor makes the appropriate adjustment with detailed comments on the student’s degree audit. The Advisor will also enter a note on the STRK screen and notify the student of the decision.

**Program Observation**

The Operations Technology Program is service-focused and is well positioned in an economy that is transitioning from a manufacturing to a service economy. While the regional economy has taken its toll on enrollment, there appear to be additional sources of potential students for the program. Recruiting activities should be expanded by including health providers, by including supply chain organizations, and by teaming with workforce retraining centers. Creative brochures placed in human resource departments, workforce retraining centers and secondary school counseling offices could help lead to larger enrollments. This program should place high priority on increasing awareness with the public.

**Operations Technology**

**Marketing Plan**

**Adult:**

• GCCC (Greene County Career Center)

• DW (Displaced Workers)

• Silfex

• Those students who have been out of high school one year or more

• Montgomery County Job Center

**Current Students:**

Target Sinclair’s undecided students and those with an interest in business —send email re: OPT program event

**Recruitment Activities Expanded:**

• Focus on the above tech prep high schools during the spring recruitment process (involve an OPT faculty member in the recruitment process when possible)

• Better inform our admission counselors of the OPT program with a focus on spring 2011 recruiting

• At the college fairs admissions will be in attendance to this spring we will have additional OPT literature

• Market OPT to the appropriate tech prep programs that could feed into OPT

**Increased public awareness:**

• Email to our current students re: upcoming OPT event

• OPT testimonial postcard—select a graduate and give success story

**OPT Event:**

Open house lab with hands-on K’Nex

**Agenda:**

• Welcome from Director of Admissions (Enrollment and Financial Aid - How to Begin)

• Introduce Mr. Charlie Winarchick

Program description and expectations

Employment and placement stats

• Brief presentation from an OPT Sinclair graduate (testimonial)

• K’Nex hands-on activity with students

• Conclude with a small scholarship awarded for winner of K’Nex project

**HS Market Segment Focus:**

1. Tech Prep schools

2. GCCC (Greene County Career Center)

3. WCCC (Warren County Career Center)

4. Butler Tech

5. MVCTC (Miami Valley Career Technical Center)

6. Bellbrook HS

7. Centerville HS

8. Russell Lee Tech Center

9. Fairfield HS

10. Options Academy

11. Ross HS

12. Talawanda HS

13. Ponitz CTC

14. Dunbar HS

15. Reynoldsburg HS

16. Fairborn HS

17. Xenia HS

18. Greenville HS

19. Hamilton HS

20. Kettering Fairmont HS

21. Miamisburg HS

22. Oakwood HS

23. Northwest CC

24. Ohio Hi-Point CC

25. Springfield HS

26. Springfield Clark CTC

27. Stebbins HS

28. Stivers School for the Arts

29. Thurgood Marshall

30. Upper Valley JVS

31. Franklin HS

32. Greentree Academy

33. Kings HS

34. Lebanon HS

35. Little Miami HS

36. Springboro HS

37. Wayne HS

**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**.

|  |  |  |  |
| --- | --- | --- | --- |
| **Operations Technology** 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) Technical communication skills**  Demonstrate appropriate technical communication skills (written, verbal, and drawing). | OPT 126,216,212,278 |  | Written Survey – Using the OPT 278 Capstone Reflection Survey, at least 80% of students rated question #3 as a 3 or 4  External Examiner – Using the OPT 278 Employer Assessment of Capstone Student Performance, at least 80% of the students met or exceeded requirements on items 14-17.  Locally Developed Exams – Using the OPT 126 Mid-Term Exam, at least 80% of the students scored 80% or better on the questions related to technical communications: #’s 13-20.  Portfolio/Project Appraisal – Using the OPT 278 Project Rubric, at least 80% of teams scored a 4 or 5 on items A, B, C, D, E, F, G  Portfolio/Project Appraisal – Using the OPT 212 Project Rubric, at least 80% of teams scored a 4 or 5 on items A, B, C, D, E, F, G  Portfolio/Project Appraisal – Using the OPT 216 Project Rubric, at least 80% of teams scored a 4 or 5 on items A, B, C, D, E, F, G |
| **2) Continuous Improvement**  Use continuous improvement techniques to reduce operational waste, improve cost efficiency and increase system productivity. | OPT 101,130,206,207,240,278 |  | Written Survey – Using the OPT 278 Capstone Reflection Survey, at least 80% of students rated questions #1, 4 and 5 as a 3 or 4  Archival Records – At least 80% of OPT 240 students earned their Six Sigma Green Belt Certificate upon completion of the course  Portfolio/Project Appraisal – Using the OPT 278 Project Rubric, at least 80% of teams scored a 4 or 5 on items C and G  Portfolio/Project Appraisal – Using the OPT 130 Project Rubric, at least 80% of teams scored a 4 or 5 on items C and G  Portfolio/Project Appraisal – Using the OPT 206 Project Rubric, at least 80% of teams scored a 4 or 5 on items C and G |
| **3) Quality**  Document, monitor, evaluate and improve product and process quality through the use of a variety of quality tools and techniques. | OPT 101,125,223,201,240,278 |  | Written Survey – Using the OPT 278 Capstone Reflection Survey, at least 80% of students rated question #?? as a 3 or 4  Archival Records – At least 80% of OPT 240 students earned their Six Sigma Green Belt Certificate upon completion of the course  Locally Developed Exams – Using the OPT 125 Final Exam, at least 80% of the students scored 80% or better on the questions related to Quality: #’s 3 and 6.  Locally Developed Exams – Using the OPT 201 Final Exam, at least 80% of the students scored 80% or better on the questions related to Quality: all questions. |
| **4) Technical Analysis**  Analyze the cost, performance and value of operations. | OPT 206,207,208,209,251,278 |  | Written Survey – Using the OPT 278 Capstone Reflection Survey, at least 80% of students rated question 2 as a 3 or 4  External Examiner – Using the OPT 278 Employer Assessment of Capstone Student Performance, at least 80% of the students met or exceeded requirements on items 4, 5, 11, 12, 13, 20, 21, 22.  Portfolio/Project Appraisal – Using the OPT 278 Project Rubric, at least 80% of teams scored a 4 or 5 on items C and G  Portfolio/Project Appraisal – Using the OPT 206 Project Rubric, at least 80% of teams scored a 4 or 5 on items C and G  Locally Developed Exams – Using the OPT 209 Final Exam, at least 80% of the students scored 80% or better on the questions related to Technical Analysis: all questions. |
| **5) Human interaction**  Demonstrate principles of human integration into technical operations through ergonomics, workplace safety and supervision. | OPT 101,105,110,111,112,125,216,278 |  | Written Survey – Using the OPT 278 Capstone Reflection Survey, at least 80% of students rated questions 3,6, 7, 8 as a 3 or 4  External Examiner – Using the OPT 278 Employer Assessment of Capstone Student Performance, at least 80% of the students met or exceeded requirements on items 3, 8, 10, 18, 19.  Archival Records – At least 80% of OPT 105 students earned their OSHA 10 Hour Card upon completion of the course  Locally Developed Exams – Using the OPT 126 Final Exam, at least 80% of the students scored 80% or better on the questions related to human interaction: all questions.  Locally Developed Exams – Using the ETD 121 Final Exam, at least 80% of the students scored 80% or better on the questions related to human interaction: all questions.  Portfolio/Project Appraisal – Using the OPT 126 Project Rubric, at least 80% of teams scored a 4 or 5 on items A, B, C, E, and G. |

a) For the assessment methods listed in the table above, what were the results? What changes are planned as a result of the data? How will you determine whether those changes had an impact?

The changes listed in the table above were modified due to the ABET visit and observations. We are collecting data on all outcomes in the manner described in the above table, for the current year (Winter and Spring 2011).

For the year 2009-10:

We mentioned above some changes made in the trend analysis. Additional information is provided below.

For OPT 126- Supervision and Team Leadership, 92% students scored higher than a 75% on the class project and 89% of the students scored higher than 75% on the homework assignments. Based on this data, nothing was changed in the course.

For OPT 212- Operations Project Management, 100% of the students scored 70% or better on the class project. We had some feedback from the students that the project may be a little vague and we are investigating whether we should try a new project. As we migrate to semesters, OPT 126 and OPT 212 will be merged into one course. If we change the project, we will continue to monitor and plot the data over time looking for trends. Our goal is student success and all our focus is on that.

For OPT 216-Facillities Planning, 90% of the students met the rubric requirements above. We are monitoring and tracking the results. For now, nothing appears to need changed.

b) What other changes have been made in past years as a result of assessment of program outcomes? What evidence is there that these changes have had an impact?

We have implemented the Engineering Technology Core Curriculum, and we are still evaluating the results. From our perspective OPT 101- Introduction to Operations, OPT 105-Introduction to OSHA General Industry Standards and OPT 205- manufacturing Processes have been added to the core curriculum and has resulted in more FTE’s for the Program. We also transferred OPT 132 AND 133 (Metallurgy and non-metallic materials) to the Mechanical Engineering Department, which resulted in a loss of FTE’s. Overall, it appears to be a wash. Since we went through accreditation of the Program, we looked at every course and the recommendations of the Program evaluators to find gaps where we can strengthen our Program. That is what we are working on now and getting ready for the Q2S switch.

The biggest change in the past years has been the change in name to Operations Technology. We are now focusing most of our efforts to ensure long term viability of the Program. Recruiting is our highest priority (along with the Q2S switch).

c) Describe general education changes/improvements in your program/department during this past academic year (09-10).

No changes were made in the General Education requirements for the program, other than adding SCC101 as part of the curriculum. There are some planned for the Q2S switch. We have redone every Program and Certificate to make the move and a lot of it revolves around changes in the Math , Science and Gen Ed hours, and also the combining and eliminating of courses currently in the quarters curriculum. All of these proposed changes have been approved by our Industry Advisory Committee.

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

1. **FY 09-10:** What other improvement efforts did the department make in FY 09-10?  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 biggest changes we made to the program was implementing the Engineering Core Curriculum, getting ready for ABET accreditation and the Q2S switch. We did hire several new Adjunct instructors and spent some time getting them up to speed. The course notes were tweaked where we felt the need and most of our courses now have Master notes on PowerPoint slides.

Our biggest weakness was collecting and analyzing hard data at the very detailed level. This was emphasized during the ABET visit and we now have plans in place to address this. The ability to attract students into the program is a major concern for all. We have plans underway to address this.

1. **FY 10-11:** What improvement efforts does the department have planned for FY 10-11? How will you know whether you have been successful?

We have gone through the ABET evaluation and have responded to their weaknesses, concerns, and observations. We are now implementing the means to address these issues, which will make analysis and assessment of the Program much easier and better. Gaining accreditation will be one of the key measures we have in determining how successful we were. As we focus on the switch to Semesters, this information will help create a successful Program, consistent with the demands of the students and of industry. The real test is whether we can increase enrollment levels to past numbers while maintaining strict focus on student success.

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.