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

**Program:** Fire Science Technology

**Section I: Trend Data**

1. **Program Trend Data**

The FST program currently has two academic programs, The Fire Science Technology (FST) and the Fire Science Technology Fire Administration Option (FST.FAO), several certificates, Professional Firefighter, Fire Company Officer, Fire Executive Officer, Industrial Fire Protection Technician. The program also grants State of Ohio certifications in Volunteer Firefighter, Firefighter Level I, Firefighter Level II, Fire Safety Inspector and Fire Instructor. The program also has accreditation to award Pro-Board certificates for Firefighter I and II, Fire Instructor I, and Fire Officer I and II.

Currently there are 116 students in the FST Degree and 56 in the Fire Administration Option for a total of 172. This is down from a high of 217 in 2008. Most of these students are in one or more of the short-time certificate programs as well. The largest short term certificate is the Professional Firefighter with 112 students. The 2008 year had 146 students in the Professional Firefighter Certificate. The remainder certificates programs number 44 students in 2010.

2010 5 YR AV

FST Degrees 8 7.4

Professional FF Cert 76 91.5

Co. Officer Cert 17 16.3

Ex Officer Cert 9 8.7

State of Ohio Certifications Awarded

Ohio Volunteer 19

Ohio Fire Firefighter I Cert 167

Ohio Firefighter II Cert 101

Ohio Fire Inspector Cert 63

Ohio Fire Instructor Cert 5

Total Ohio Certifications 355

Total Ohio Certifications (2009) 406

In 2010 the program awarded 308 Pro-Board Certificates. In 2009 we awarded 212.

Sinclair community college awards more Ohio certifications than any other training institution in the state. The closest two competitors are the Great Oaks Vocational School system, near Cincinnati, and the Ohio Fire Academy, Reynoldsburg. The exact numbers are unknown. For political reasons the Ohio Department of Public Safety doesn’t release gross totals. In conversations with representatives of the ODPS, we were informed that Sinclair is the largest certifier in the state and has one of the highest, if not the highest, pass rate percentages. It is rumored that state will release in the near future statistics of certification totals, average scores and related data. Many of the 66 ODPS (Sinclair is only one of 66 organizations doing fire certification education) chartered organizations are requesting data for program assessment, benchmarking and related needs.

The current pass rate in the FST courses is 83.4 % compared to the BPS Division is rate is 70.4%. The pass rate in the academy/certification classes for 2010 vs. 5 year average

2010 5 YR AV

Volunteer Firefighter 66. 7% 52.7%

Firefighter I 78.1% 80.9%

Firefighter II 90.5% 89.8%

Fire Safety Inspector 93.5% 93.2%

Fire Instructor 93.8% 95.3%

The Pro-Board Fire Officer Series has the highest success rate of one single group of courses in the program. FST 251, 252, 253, and 254 (Fire Officer I to IV) has an average of 97.5%. These classes average 97.1% over a 5 year period.

Traditionally the academic courses within the Technology based program is where the lowest pass rates are (FST 101, 102, 103, 116, 201, and 204). In 2010 these courses had a average pass rate of 73.3%, just above the BPS Division pass rates. The 5 year average for these classes is 77.3%

Currently females compose 15% of the students in the FST program. Minorities in FST have been running around 6%. Montgomery County Residents account for 54% of the academy classes; again this has remained constant over the past 5 years. In the FST Degree program, Montgomery County accounts for 56% of the students and in the FAO program Montgomery accounts for 46% of the students. The next two largest feeder populations for the academy are Green County and “Other”. Greene County usually runs 13 percent while “other” often goes as high as 15 percent. We have students driving from as far away as Cincinnati and Washington Court House.

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

Interpretation of data is difficult because the data has many conflicts. For example the Dawn Portal shows 76 students in Professional Firefighter certificate program, but we awarded 101 Firefighter Level II state certifications. These numbers should match. They are the same guys (and gals). When students complete Fire Officer II, they should get the Fire Department Company Officer certificate. Again the numbers are not matching. Several more examples could be listed.

What we believe is happening is several things. The first is a “declaring a major” issue. A large percentage of the fire students come to us as something else. They just wanted to take the EMT basic class, but decided to keep going. They might have started out as a non-FST major dropped out, returned but stay listed under their old major. They just listed personal interest when they apply, or they are listed as a transfer student under some odd classification. Whenever we find a lost and wandering soul, we tagged him/her as a FST student, but we are not catching everyone. Even when we preach each class to “check your major” and see if it is correct, some individuals are still slipping through the cracks. One student, who was a non-FST major but wanted the certification to assist his home town as a volunteer, didn’t understand that he could list multiple majors. He was afraid that listing multiple majors would jeopardize his financial aid.

The second issue is the growing number of former students from the career tech centers. They were awarded their Firefighter I certification from Miami Valley CTC (or somewhere), then realize the error of their ways and then they come to Sinclair for Firefighter II. Since they didn’t take Firefighter I from us, the advisors sign a prerequisite waiver, and the student doesn’t have the two classes they need for the certificate. When we identify them, we grant credit so that we can give the certificate. If a more detailed means of determining or capturing declared majors could be found, it would improve things greatly, not only certificates but the degree programs as well.

As mentioned earlier in 2010, 15% of the students in the FST program were female. This is double the approximate 7 percent last year. Almost of these students were in the academy classes. Women are now looking to the emergency services as possible career paths.

The minority population of the program was about 6%, the same as last year. Unfortunately we didn’t have any African-American females. Hopefully the seeds that are being planted at David Ponitz CTC will be bearing fruit soon.

We continue to have one of the highest, if not the highest, pass rates for the Fire Safety Inspector Class. For reasons we still don’t fully understand, the state rewrote the fire inspector examination. They felt the test was too easy and wanted a smaller success rate. The test was written with 50% pass target in mind, Our classes still have a 93% pass rate.

One of the disappointing success rates is found within the State of Ohio Volunteer class, FST 191. This is the one state class that we do have information to compare with other schools state wide. We only offer this class off campus on as requested basis. A couple of years ago the state changed the curriculum and the focus of certification examination. In many programs the pass rate has been less than 50%. Last year we had a 66% success rate.

We have seen a 22% percentage decrease in the certification classes (Volunteer Firefighter, Firefighter I and II). This past year we only offered about half of the off campus (fire station based) classes we normally do. The recruiting of firefighters, especially volunteers, is becoming an issue for many communities. We also know that the news out of Dayton is not good. With many cities and townships considering layoffs in the emergency services (Fairborn, Xenia, Trotwood, etc), recruitment becomes difficult at times.

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

1. What was the fiscal year of the most recent Program Review for this program? 2007
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”)?

Our students have responded that they want more outreach courses. They wanted more options to the traditional downtown campus option. With the increasing fiscal pressure most fire departments are experiencing the ability to get time of shift or a shift trade is practically gone. We did this by one, continuing to offer classes off campus at outreach sites. (City of Mason Fire Department, Bethel Township Fire Department, Washington Township, Vandalia Fire Department among others. And the other is by virtual classroom technology. By using the Adobe Connect system, the students can live and participate in real time on days they are on duty and cannot travel to campus. Currently we are offering the following classes by live web steaming: FST 101, 102, 103, 116, 201, 204, 253, 254

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

No they have not. The future of fire science, as we look out over the landscape (and sneak in and spy at other program web sites), is developing alternatives to delivery because of the 24/48 shift schedule of the fire service.

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

The entire focus of the past year was the keep the passing rates for the academy classes at a high rate. In 2010-11 the department moved the Pro-Board tests to the ANGEL system. This move was an effort to improve the management of the increasing volume of students in the academy program. What we found out was that the written (on-line ANGEL) Pro-Board test was harder than the state test. If they pass the Pro-board test, the students almost always (99%) pass the state test.

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?

* The existing certificates and programs in the department fail to show an adequate number of completions.

*Action*: This continues to be problem. For example the program runs over 150 Firefighter I students and over 100 Firefighter II students a year through he academy, but the Professional Firefighter Certificate does not show those numbers. FST 254 is the capstone in the FST.FAO program, which averages 10 students a year, but only of handful of graduates show up accounted for. FST 251 and 252 students should get the Fire Company Officer certificate, but again the numbers are short. We believe that fire students when they enter as newbie’s are signing up for classes under variety of designations: EMT, general interest, or whatever. Getting the right major is a constant battle.

* Use of quantitative and qualitative evidence to improve student learning and student success was notably absent from the self-study documents. The department should immediately develop a systematic assessment plan to collect and analyze data on student learning and make improvements to curriculum and instruction based on this evidence.

*Action:* Moving all testing of the Pro-Board classes (FST 181, 193, 251, and 252) to ANGEL in hope that we will get tracking the data we need. Not enough data at this time to make any assessments except that the Pro-Board ANGEL tests are a lot harder than the state test as mentioned earlier. All students tell us the state test was easy compared to the Pro-Board.

* Continue to seek partnerships to promote education of students through collaborations with Wright Patterson Air Force Base, Bowling Green University, Ohio State University, University of Cincinnati and Eastern Kentucky University and the local community.

*Action*: The FST department has become more involved in the community.

* Promote students’ awareness of the value of degree and certificate completion, not just short term course work.

Action: See Above

* Integrate the ABET findings and recommendations with the program review process so that one informs and improves the other. Incorporate the ABET-initiated departmental actions into the plans and actions emanating from this review.

Action: This was an EVT and SET (SRM) concern.

* Enlist the assistance of Research, Analytics and Reporting (RAR) to identify and analyze the predominant curriculum pathways of students in EVT, FST, and SET to improve completion rates.

Action: SET (SRM) and EVT are no longer part of the FST program. The tracking of students and career/ educational progress is being explored by the establishment of a “FaceBook” page and several other non-traditional avenues. AT this time the FST data base has over 400 graduates, current students and former students. However exact addresses continue to be a problem.

* Implement programming associated with the continuing education opportunities created by the recently passed CE legislation discussed during the review.

*Action*; The effort to offer Con-Ed hours to regional firefighters to meet growing state of Ohio Con-Ed requirements did not produce the expected result. Unfortunately the fiscal status of many public emergency service organizations is limited and our attempts proved less than satisfactory. We partnered with the Miami Valley Fire/EMS Alliance for workshops and training activities and by volunteering to serve on the organizing committees; Sinclair is getting very visible commercial space and time. We also have been successful in developing partnership with a local fire sprinkler company to offer free Con-Ed training in our lab. In return we get recruiting time with attendees

* Analyze the apparent disconnect between labor predictions and student perception in EVT& FST. Use CC Benefits, exit interviews, advisory committees and community contacts
* *Action*: EVT is longer a part of the department. In FST the Advisory Committee was increased in size to include some additional stakeholders. Sinclair is an active member of the Greater Montgomery County Fire Chief’s Association, Miami Valley Fire/EMS Alliance, Southwest Fire Safety Council, Ohio Society of Fire Protection Engineers.

**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**.

|  |  |  |  |
| --- | --- | --- | --- |
| **Fire Science 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)** Apply chemistry, mathematics, physics and engineering principals to solve fire protection engineering problems. | 101, 116, 201, 204, |  | * Cross walk with FESHE and NICET standards |
| **2)** Apply/interpret the National Fire Codes in reviewing engineering plans of fire detection and suppression systems | 103, 120, 116, 204, |  | * State certification exam (120) |
| **3)** Investigate the results of a fire to determine point of origin and cause of the fire. | 125 |  |  |
| **4)** Develop an understanding of the principles of managing fire protection risk and loss control as it pertains to fire hazard/risk assessment. | 209, 251,252,253,254 |  | * Simulations (all) * Pro-Board Exam (all) * Performance appraisals (all) * State certification exam (209) |
| **5)** Apply engineering principals in the design of fire alarms and early detection systems. | 120, 116, 204 |  |  |
| **6)** Understand pyrotechnics of materials, interior finishes and the fire retardant properties of materials when used as structural components. | 101, 103, 120 |  |  |
| **7)** Design an early detection, warning and suppression systems for various types of building occupancies. | 116, 201, 204 |  | * Cross walk with FESHE and NICET standards |
| **8)** Understand the design aspects of an HVAC smoke and heat removal system. | 101, 103, 120, 202, |  |  |

The above matrix doesn’t reflect the programs as they have developed and evolved. It was filled out in case the need for comparing to past years is required.

In the redesign of the program to become semester friendly, it was felt by the Advisory Committee that the course outcomes needed revisited. The course outcomes were tired and out dated. The two programs continued to growth farther and farther apart, but they were still trying to fit into a single set of course outcomes. Below are the program outcomes broken down for the two now existing FST programs. Last year these were submitted to the CMT coordinator.

|  |  |  |  |
| --- | --- | --- | --- |
| Fire Science Technology: Fire Administration Option: 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. Administration and management of the fire service employee base. This includes rules and regulations and ordinances and documents, personnel issues and other related leadership and organizational concerns | 251, 252, 253, 254, 103 (or 120) | x | The redesign of the skill sheets for 253, 254 |
| 1. Planning, developing, and managing a Fire Protection and EMS delivery system | 253. 254 | x | The redesign of the skill sheets for 253, 254 |
| 1. Understand chemistry and physics of fire, fire behavior and prediction of fire spread, with particular emphasis on building construction and the role the building plays in fire development. | 101, 193, 103, (or 120), 202 | x | Cross walk with FESHE and NICET standards |
| 1. Apply and interpret national and local fire and building codes. | 103 (or 120) |  |  |
| 1. Understand the operation, design, and application of various fire suppression, (water and non-water) detection, notification and communication systems. | 116, 201, 204 |  |  |
| 1. Understand the issues involving firefighter occupational safety and health and the role the fire service professional has in it. | 251, 252, 253  254 |  |  |
| 1. Public fire safety risk assessment and evaluation and related hazards as well as the Management of Emergency Management and Planning functions. | 253, 254 | x | The redesign of the skill sheets for 253, 254 |
| 1. The understanding and utilization of the Incident Management System (IMS) | 251, 252, 253, 254 | x | The redesign of the skill sheets for 253, 254 |
| 1. Investigate the results of a fire to determine the point of origin and cause of fire | 125, 251, 253 |  |  |

Learning Outcomes FST

|  |  |  |  |
| --- | --- | --- | --- |
| Fire Science 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. Apply chemistry, mathematics, physics and engineering principals to solve fire protection engineering technology problems | 101, 116, 201, 204 | x | Cross walk with FESHE and NICET standards |
| 1. Apply and interpret the National Fire Codes and other related local fire and building codes and standards in the mitigation of fire protection hazards and problems. | 103, 116, 204 |  |  |
| 1. Develop an understanding of the principles of fire protection risk and risk assessment as it pertains to the fire protection environment | 101, 102, | x | Cross walk with FESHE and NICET standards |
| 1. Understand the principles of Occupational Safety and Health and the role it plays in the commercial and industrial fire protection profession. | 102 | x | Cross walk with FESHE and NICET standards |
| 1. Understand pyrotechnics of materials, interior finishes and the fire retardant properties of materials when used as structural components. | 101, 103 |  |  |
| 1. Design detection, notification, communication and suppression systems for various types of building occupancies. | 103, 116, 204 |  |  |
| 1. Understand the various auxiliary building support systems and the role they play in fire protection. | 103 |  |  |

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?

In dealing with the 251 and 252 series classes, the students area assessed by a nationally and locally validated test bank of over 1,000 questions (They get a random selection) as well as practical skill check off sheets. These questions and skill sheets are directly tied to the National Fire Protection Association (NFPA) 1021 Standard (i.e. 1021.5-6.1: types of public budget systems). The FST 253 and 254 students also get practical skill check off sheets based on a classroom simulation known as Sinclair City. As with 251 and 252 classes, the NFPA 1021 Standard is used for 253 and 254. During the spring of 2011 the skill sheets for 253 and 254 were redesigned and evaluated by the Advisory Committee. Every attempt was made to ensure that all objectives within the National Fire Protection Association Standard 1021 was addressed in course delivery and assessed by a practical skill sheet.

The fire academy classes (181 and 193) are assessed two ways. First the students are assessed to the Pro-Board standard by practical skill sheets and a test bank of over 1,400 questions. Each skill and question is tied to an actual standard objective in the NFPA 1001 standard. They all so are tested by the State of Ohio Certification exam. Since we have over 1,400 questions in the test bank and students get random questions, not enough students have taken each question as of yet to make any determination on individual questions. A couple of questions have yet to be chosen. However since we went to the Pro-Board test bank exam, the scores on state certification tests have been 5 to 10 percent higher. The state gives each student three attempts on a state certification exam. Majority of the time our students do not need the re-test option, but when they do we have seen a drop of 20% retests since we went to the random test bank exam.

In the Referring to the classes above in the chart a couple of observations are to be made

In 2010-2011 the entire FST curriculum was reassessed and rewritten per request by the Ohio Board of Regents. The programs were redesigned to meet the Fire and Emergency Services in Higher Education (FESHE Model). It appears that most of the other two year schools in Ohio are moving, or have already moved, in that direction. The OBR desire was for the various fire programs in the state be on a common sheet of music when semesters conversion occurs. FESHE was the common denominator that was chosen. FESHE was an initiative out of the United States Fire Academy several years back to try to standardize the two and four year programs across the country. Each course has well defined course outcomes and objectives as well as master syllabus and related information. The following quarter courses were FESHE-ized starting in the winter so that the semester transition would be less painful.

FST 101

FST 102

FST 103

FST 125

FST 201

FST 202

FST 116 (Will be combined with 204 in semester world)

FST 204 (Will be combined with 116 in semester world)

In addition to the FESHA components, we wanted to incorporate more engineering based material. We wanted to prepare our students to take the National Institute for Certification in Engineering Technology (NICET) Level One exam for Fire Protection System Designer. Additional “elements” (Elements are what NICET calls learning objectives) were added to the following classes: 101, 103, 116, 201, and 204.

Also we were trying to assess two programs that were totally different with a single list of outcomes. The FST program was an engineering based technology program and the FST.FAO program was an administration program. One program was private protection, more technical and the other one was public sector, administration based. In a short sentence, the program outcomes don’t fit either program in now in existence.

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?

In January the department attended the Annual Pro-Board conference in San Diego. Up to that time the department was close to applying for an extension of our Pro-Board accreditation to include Fire Officer III and IV and with a little luck, Fire Instructor II. However the department realizes that we were heading down the wrong path and in the spring designed the Skill Assessment Sheets and related information packets to address the National Fire Protection Association Standard (NFPA) 1021 standard. Hopefully this revisit of the skill sheets will meet the Pro-Board criteria for those courses.

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

See earlier comments on FESHE and NICET and semester

**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 department offered more virtual classes than last FY FST 102, 253, and 254 were added
* As mentioned the Pro-Board classes were moved to the ANGEL system to help track trends and student progress.
* Also the skill assessment sheets for the Fire Officer III (FST 253) and Fire Officer IV (FST 254) courses were designed due to the realization that when the chair returned from the San Diego Pro-Board conference, we were going down the wrong path. These skill sheets and the instructional packet design to assist were circulated among the FST Advisory Committee. Comments were received and recommendations accepted and the summer FST 253 and fall FST 254 classes were used as trial runs.

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 continued to develop the virtual classroom tool. As mentioned earlier, the students are in need of an alternative to on campus delivery. The department is investigating the possibility once semester world is here just how much can be done in that distance learning format. This strategy is not for the certification classes. The State of Ohio in the certification courses does not recognize any other delivery system but face to face. Rumors are circulating that there could a change coming in the near future. But knowing the state as I do, I am not holding my breath.

We will continue to work on Pro-Board accreditation extension in the areas of Fire Officer III and IV and Fire Instructor II. The use of national yardsticks is critical in ensuring we are going in the correct direction with our program.

We will work to improve our linkages with David Ponitz High School; Miami Valley CTC, Warren County CTC and Butler Tech.

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.