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

**Program:** Electronics Engineering Technology (EET)

**Section I: Trend Data**

1. **Program Trend Data**

**Enrollment:** Enrollment in the EET program has increased gradually and has been stable in the past two years as is obvious from the data below. Active students have stayed at 287 whereas FTE have shown an upward trend currently at 368. Electronics program has also seen an increase in number of graduates during the previous year.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EET - Active Students Fall 2006-2010** | | | | |
| **06-FA** | **07-FA** | **08-FA** | **09-FA** | **10-FA** |
| **213** | **200** | **199** | **287** | **287** |
| |  | | --- | |  | |  |  |  |  |

**EET Actual FTEs FY 2004-2010**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Term** | **FY 04-05** | **FY 05-06** | **FY 06-07** | **FY 07-08** | **FY 08-09** | **FY 09-10** |
| **TOTAL** | 256.7 | 218.6 | 233.6 | 275.5 | 327.5 | 368.7 |

**EET Program Graduates FY 2006-2010**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Term** | **FY 05-06** | **FY 06-07** | **FY 07-08** | **FY 08-09** | **FY 09-10** |
| **TOTAL** | 17 | 7 | 24 | 16 | 23 |

For fall 2010, Montgomery County accounts for 68% of the enrollment followed by Greene County, 12.6%, as the primary service areas. There are 66% Caucasian males, 19% African Americans, and 8.6% females in the program.

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?*

There are four main reasons for the nearly 30% increase in enrollment:

1. Targeted TV advertisement for the EET program. Electronics program has tough competition from two trade schools in the area for the high school and MVCTC graduates.
2. Offering service courses EET 120, EET 139, EET 166, EET 198 for the ACT, ETD and HVAC programs; EET 181-184 series to support the electrical construction industry in the Miami Valley supported by non-union associations such as ABC and MECA. They send a cohort of company sponsored employees leading to a Short-term Technical Certificate.
3. Special programs with area high schools to offer EET courses at their locations (CHS, MVCTC, Kettering Fairmont) as well as transfer students through *Tech Prep, QuickStart and Project Lead The Way*, earning college credit and hence advanced placement in the EET program.
4. There is a direct correlation between economy and enrollment in technology programs.

**Graduation and Courses Success Rates:** Electronics program has regained graduation in the last year from 16 in FY 08-09 to 23 in FY 09-10. It can be attributed to increase in individual course success rates in the 200 level courses by 8 to 12% (except one course). There has been a special effort by the EET faculty to advise students every quarter for continuity in their learning.

EET program has three major sequences, EET 114-150-155; EET 131-251-252 and EET 261-262, culminating in the capstone course EET 278. Advising student to complete a sequence in successive quarters really helps them retain knowledge and skills to be more successful in subsequent courses. Also there is a good deal of cross learning in EET 252-261-262. These observations are based on student feedback as well as analysis done for the recent TAC/ABET\* accreditation visit in October 2010 (EET program completed an exhaustive Self-Study and had no citations!).

Retention data, provided as a part of the review process, does not indicate any obvious trend to make a clear judgment. Retention in the program has increased from 57.14% to 64.34% but the factors for better retention cannot be substantiated very clearly. Is it a result of poor economy? This is one of the areas where efforts will be increased to attribute solid reasons for the coming years.

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

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

FY 2008 – 09

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

* Series of core courses were implemented in the winter of 2010.
* With the completion of program realignment special attention was paid to make adjustments to course materials to better match the program outcomes.
* Realigned the program to teach less history and more up to date technology by offering new courses as electives, EET 156-Alternate Energy Sources, EET 256-Fuel Cells, EET 157- RFID Technology. EET 281-PLCs was made a required course for the program due to the changing needs of the local industry and as recommended by the EET Advisory Committee.

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

There is a national trend as well industry need for EET graduates to have systems level skills and knowledge. Hence 200 level EET courses are being updated to introduce more systems approach into the course materials especially the lab component. This is where the industry is heading. A strong emphasis is being placed on “Service” as opposed to “Manufacturing” due to the changing nature of the local industry (closure of Delphi and GM plants).

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

* A major update and reshuffling of courses was made. Circuits sequence EET 114-150-155-205 was redesigned to be a three course sequence, EET 114-150-155. Also, analog electronics course sequence EET 201-202-207 was redesigned to be EET 201-207. EET 202 and EET 205 have been deactivated. This was possible due to emphasis on use of simulation software *Multisim*© for analysis that saves instruction time.
* Digital Logic and Gates course, EET 231, was appropriately renumbered as EET 131 to reflect the introductory nature of the course material. Similarly EET 259 programming course was appropriately renumbered as EET 159.
* Introductory course EET 116, Schematics and Layouts, has been updated to emphasize use of *Multisim*© for schematic drawing and use of *Ultiboard©* software for printed circuit board layout.

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?

No report or comments could be found for reporting.

**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**.

|  |  |  |  |
| --- | --- | --- | --- |
| **Electronics Engineering 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)** Design & Assembly | EET 114, 131, 251, 261, 262, 278 |  | * Lab reports * Portfolios * Project assessment * Specially designed applications |
| **2)** Circuit analysis | EET 114, 150, 155, 201, 207 |  |  |
| **3)** Computer skills | EET 114, 116, 131, 159, 251, 252, 261, 262 |  | * Student performance on labs * Homework assignments and exams. * End-of-quarter student evaluations. |
| **4)** Test and troubleshoot | All EET courses |  |  |
| **5)** Teamwork | EET 150, 262, 278 |  |  |
| **6)** Communication | All EET courses, (specially  EET 150, 278) |  | * Presentations using Gen Ed Rubrics * Lab report Evaluation Rubric |
| **7)** Citizenship | HUM and SOC |  |  |
| **8)** Lifelong learning | EET 252, 261, 262 |  |  |
| **8)** Professionalism | EET 252, 262, 278 |  |  |

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?

**EET Continuous Improvement Plan:**

EET department uses the PSDA assessment model:

* Each course has a detailed “*Course Outcomes Guide*” with at least three course outcomes directly linked to program outcomes for assessment. The COGs are updated on an annual basis.
* Year-end specially developed “*Course Feedback Forms*” are used to summarize and document collected data, record observations, and proposed changes.
* Course changes are assessed and tracked for the next year to measure effectiveness and additional changes, if any.
* Formative assessment is used in the capstone course EET 278 using locally developed exams to assess knowledge and skills for the entire program (course reviews is an integral part of this activity), and using rubrics for assessing presentations, demonstration of a working project.
* Department chair conducts “*Graduate Exit Interviews*” with all graduating EET students and collects feedback using a divisional feedback form. Feedback is analyzed and discussed in an annual departmental retreat for action items.
* Every three years graduate and employer surveys are conducted.
* EET Advisory Committee plays a vital role in data analysis and suggesting actions for an effective program.

**Changes to EET program during FY 2010-11:**

Following are the changes made as a result of the assessment:

**EET 114:**

* Updated *Resistor Color Code,* *Breadboarding, Ohm’s Law, and Test Points* handouts based on student feedback. This supports systems approach. New homework was added for retention of course materials.

**EET 131:**

* Modified the existing lab approach in the course to cover the oscilloscope during weeks 8, 9 & 10 of the quarter.

**EET 159:**

* Upgraded *LabVIEW* software to Version 8.6.
* Tested students with midterm exam, in addition to short weekly quizzes and final exam.
* Created a new lab activity on clusters and assigned it during the last lab period of the quarter.
* Used National Instruments’ *LabVIEW* Fundamentals Exam in addition to locally developed quizzes and exams.
* Switched to new edition of textbook: Robert H. Bishop’s *LabVIEW 2009 Student Edition* (© 2010).

**EET 251:**

* Revised Lab #2 to introduce 7-segment display decoder.
* Revised Lab #4 and Lab #5 instructions for clarity.
* Revised Lab#6 and Lab #7 to emphasize variety of counter chips and methods of cascading them.
* Revised homework assignments to include more troubleshooting exercises, particularly ones using *Multisim*; also added *Multisim* troubleshooting exercises to midterm and final exams.

**EET 261-262:**

* EET 261 will be based on PIC Controllers and EET 262 will use Motorola MCHC11 microcontroller.

**EET 281**

* Rewrote 4 of the 10 labs to be more challenging
* Converted all the labs to work with *AB Micrologix* PLC software

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?

* Primarily shifting the focus from component level approach to systems approach has resulted in better design and advanced level capstone projects. There is documented evidence from the level of capstone projects where students are designing, assembling, troubleshooting latest and very complex projects.
* Updated the EET 114-150-155, EET 201-207 and EET 131-251-252 course sequences. Assessment of these changes is in progress for a 3-year cycle.
* Major updating of courses has resulted in better prepared EET graduate as evidenced by recent Graduate and Employer Surveys.
* Recent TAC/ABET\* accreditation visit was very successful with no citations at all. This is result of EET program meeting the ABET General Criteria *‘a thru k’* and the IEEE program criteria of *Competency Based Education,* and a very well documented *Continuous Improvement Plan* with solid evidence (e.g. examples of student work documenting improvement in learning) presented to the evaluators supporting assessment techniques. A 132 page EET Self-Study report was submitted.

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

* Emphasis on Technical Lab Report writing.
* Assigning research topics in DC Circuits course, EET 150, with a report and each student making a presentation near end of the quarter.
* Capstone course EET 278 requiring an elaborate project report, presentation using *PowerPoint* and a working project demo to invited faculty and students.

**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.

Electronics is a fast changing field and the department tries to adopt new technology to ensure that graduates are better prepared to meet employer needs. Adoption of contemporary technology requires updating of equipment, faculty professional development and incorporating technology into existing courses. EET department has updated test equipment, updated software licenses, effective use of computers, use of multimedia technology for effective student learning (the department received two new MM Podiums in 2010). All EET courses have integrated MM presentations for delivery of instruction with some very innovative ways for demonstrations. Increased course success rates and a successful accreditation visit are clear evidence of such changes. EET faculty is attending seminars and workshops to continually update their skills.

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?

* Major thrust is Q2S conversion, especially redesigning all the EET courses.
* Conduct a Student Satisfaction Survey for increased retention and better scheduling.
* Making sure the students transition into semesters within the college mission.
* Preparing and submitting a detailed report on Q2S conversion documenting EET course and program changes to TAC/ABET for continued accreditation for the current six year cycle.