Electronics Technology

Cycles included in report:
Cycle #3 8/1/14 to 7/31/15

Program Name: Electronics Technology
Program Cycle: #3 8/1/14 to 7/31/15

1 Program Summary IR Data

For the most recent three academic years, JCCC Institutional Research (IR) provided the following data

Number of full-time faculty: 3
Number of adjunct faculty: 4

Percentage of students completing ELEC classes who enrolled in them:
Year 2011/12 - 91.6%
Year 2012/13 - 95.6%
Year 2013/14 - 92.5%

Percentage of students who were successful in the ELEC classes:
Year 2011/12 - 82.9%
Year 2012/13 - 85.3%
Year 2013/14 - 86.8%

Number of Electronics AAS degrees awarded:
Year 2011/12 - 5
Year 2012/13 - 8
Year 2013/14 - 8

Number of Electronics AAS certificates awarded:
Year 2011/12 - 7
Year 2012/13 - 10
Year 2013/14 - 7

Electronics program costs per credit hour were:
Year 2011/12 - not given
Year 2012/13 - $243.18
Year 2013/14 - $254.03

Electronics Technology [PDF 700 KB 9/23/14]

HandbookProgramReviewFall2014 [PDF 2,136 KB 9/23/14]

1.1 Degree Offerings AAS in Electronics Technology

The electronics technology degree is designed to prepare students to meet the demanding needs of today's electronics industry. Focusing on the fundamentals of electronics and related mathematics, the electronics technology program offers comprehensive, theoretical and practical knowledge of electronics technology. It covers both analog and digital systems, and allows the student to tailor their education by selecting from a range of technical electives in areas such as computer systems or communications systems.

1.2 Certificate Offerings Electronics Certificates

Industrial Controls Certificate

This certificate is designed to focus on programmable logic controllers and a variety of input and output devices. The certificate is a 9-credit-hour, 3-course sequence involving both the hardware and programming aspects of controllers used in industrial processes.

Microcomputer Technical Support Certificate

The microcomputer technical support vocational certificate is designed to provide an entry-level set of competencies that will allow the recipient to quickly perform satisfactorily in computer system help desk environment. This 6-course sequence exposes the student to significant aspects of computer

hardware, computer networks and interconnection computer software, as well as interpersonal skills.

Smart House Technology Integrator Certificate

This certificate documents training that the recipient has received to qualify for the area of installing and integrating a wide range of home networking, automation and remote control systems into homes.

2 Program Resources

The students enrolled in the Electronics Program have access to a wide range of electronic test equipment, computers, training materials and technical support personnel. The laboratories the students work in are well equipped and updated to keep the systems current with industry standards.

3 Reflection on Institutional Data

The data from Institutional Research lists three full-time faculty and four adjunct faculty. This is incorrect, evidently due to the way that faculty are counted by the system.
The actual numbers are: one full-time faculty who also serves as Program Chair, and five adjunct faculty. The difference come from that fact that two of the "IR" full-time faculty are actually full-time in the JCCC/BNSF Railroad Signalman program, and only teach 1-2 JCCC Electronics Program classes per semester.

4 Student Success

4.1 Define Student Success Student Employability

The primary goal of students enrolled in the Electronics AAS degree, or any of the certificates, is to be employed in companies or governmental agencies using advanced electronics technology. Student Success would therefore be defined as gaining the skills and knowledge need to achieve this goal. The JCCC Electronics program is thus intended to provide the student with these skills and knowledge.

Using Institutional Research, the number of Electronics AAS graduates working in a related field were:

Year 2011/12 - 67%
Year 2012/13 - 50%
Year 2013/14 - 100%

The number of Electronics Certificate completers working in a related field were:

Year 2011/12 - 67%
Year 2012/13 - 100%
Year 2013/14 - 75%

The businesses which have hired our graduates range from companies such as Electromotive Diesel Co. to governmental organizations such as the National Weather Service.

4.2 Achieve/Promote Student Success

The Electronics Program uses its Advisory Board as a source of information to update and improve the content of our classes. The Advisory Board has in particular, been very involved with the recommendations in the ongoing program/curricular modifications listed in this report.
The Program Chair also promotes the use of Internships to allow students to gain "real world" experience in Electronics Technology as well as to make contact with potential employers. In the last three years, students have interned with Electromotive Diesel Co., the Federal Aviation Administration and a local Casino (working in the IT department).

4.3 Successful Transfer

The Electronics Program is not designed to be a transfer program in the sense of general education

classes or the Pre-Engineering program, but instead to produce "job ready" technicians for a range of jobs.
That being said, JCCC has been selected by the Federal Aviation Administration (FAA), after an intensive review in 2010, as a Level 1 training site for technicians who maintain the radars and displays used to safely operate the nation's air traffic control system. Upon completion of the JCCC Electronics AAS degree, the graduate can apply directly for Level II training which is performed by the FAA itself. To date, two graduates have gone into this program.

Additionally, the Electronics AAS, along with other JCCC technical AAS degrees, are accepted by Pittsburg State University and Kansas State University as the freshman/sophomore years towards Bachelors Degrees in Technology Management at those schools. I don't have any data currently available as to any students who have exercised this option.

5 Assessment of Student Learning Outcomes

Assessment&CurriculumChart [XLS 41 KB 9/23/14]

5.1 Reflection on table provided on assessment.

Student learning outcome assessment has been designed and implemented with the present core electronics classes. Two assessment reports have been generated to this date. This methodology will be migrated into the new program structure.
Student Learning Outcomes (SLO)
#3 Communicate effectively through clear and accurate use of language.
#6 Read, analyze, and synthesize written and visual material.
#7 Select and apply appropriate problem-solving techniques.
#8 Use technology efficiently and responsibly.

There were two methods used as assessment tools in evaluating the Student Learning Outcomes during the 2011 and 2012 school years (due to changes in the program and addition of new adjunct instructors, assessment was not performed for 2013 and 2014). The first analytical method was to evaluate students response to an embedded test question in Circuit Analysis. This test question was used in both 2011 and 2012 classes. The question involved analytical skills and the application of specific mathematical formulae and calculations.
The second method was to have students take a pre- and post-test covering keys areas studied during the electronics program. The test from the International Society of Certified Electronic Technicians (ISCET). The test has seven sub-sections with each section pertaining to an area of Electronics taught at JCCC.

5.2 Significant Assessment Findings

For the previous classes, data showed a small percentage of students struggled with the mathematical calculations and application. There was also a lack of understanding in the use of electronic test equipment.
There were not enough data points to provide a reliable statistical trend so additional monitoring is required.

5.3 Ongoing Assessment Plans

A new text book has been adopted and will provide a better flow of knowledge in the core classes. Pre and post testing utilizing the ISCET test will begin after the students successfully pass their Introduction to Electronics and will continue through the remaining core classes of the program.
In addition, a closed lab has been added to all core classes to reinforce the application of electronic test equipment, testing methodologies and application. Previously, Circuit I and Circuit II were theory only classes and did not provide the student with adequate lab time.

6 Curriculum Reflection

The Electronics curriculum, as would be expected in a rapidly changing technical area, must be constantly monitored for technical relevance and job applicability. This had been done by both the

faculty, the FAA as listed above, and by the Electronics Advisory Board.

6.1 Honors Contract(s)

6.2 New Course Offerings Electronics AAS Program Modification Plan

A major revision of the Electronics AAS is in process. The intent is to update the degree to reflect industry growth in new areas of technology such as robotics, photonics and biomedical electronics fields. This involves the replacement of four current classes in analog electronics with three new ones, the creation of a completely new class in microprocessors, adding an existing programming class to the degree, replacing a current class in computer repair with an updated one, and the creation of several new classes to be used as electives. These electives will allow the student to specialize in each of the new areas listed earlier.

7 Faculty Success

7.1 Departmental Accomplishments

The electronics department continues its partnership with the Federal Aviation Administration (FAA) as a "level one" training facility for the technicians who go on to additional training as maintainers of the nation's Air Traffic Control (ATC) system. Two students are known to have entered this program.

7.2 Faculty Accomplishments

In the preceding three years, the Electronics faculty has participated in four hiring committees, chaired one Peer Review committee and supported the creation of a new JCCC AAS in Computer Support Specialist.
The faculty has also completely revamped the program's brochure and the creation of a new video about the program to be used for promotional purposes.

7.3 Innovative Research, Teaching or Community Service

The Electronics program faculty members are active in maintaining a relationship with current and future students. These include (but are not limited to):
- At least a "once per semester" tour of JCCC Student Ambassadors to familiarize them with the electronics program, so that they can explain and propose it to potential students.
- Annually participating it the Career Technology Event (CTE) event, conducting a "robot game" competition for local high school teams. This allows them to meet and interact with JCCC electronics faculty and see our facilities.
- Teaching classes during JCCC's "Free College Day". These have included a basic "Smart House" class, and one on the history of electronics.
- Holding a summer semester one day class on basic robotics for fourth to sixth grade students.

8 Goal Setting and Action Plan

8.1 Long-term Goals

- Add a new subspecialty in Industrial Robotics to the existing AAS degree
- Add a new subspecialty in Medical Electronics to the existing AAS degree
- Increase the number of full time electronics faculty to at least two, to allow a better continuity of classes and material for students. This supports a Kansas Key Performance Indicator (KPI) to improve student satisfaction.

8.1.1 Actions/Resources Required

All of the listed long term goals will required increased spending on faculty and equipment, and the new subspecialties will require additional space for the classes and labs.

8.1.2 Updates on Long-Term Goals

8.2 Short-Term Goals

- Institute a new and formalized "textbook adoption process" in compliance with that established by JCCC.
- Complete the realignment of the Electronics AAS program discussed earlier
- Establish a Photonics Technician subspecialty in the Electronics AAS.
- Increase in the number of "release time" hours for the Chair, to support the increased workload as Chair, and to allow additional time for student counseling and mentoring.

8.2.1 Actions/Resources Required

8.2.2 Updates on Short-Term Goals

9 Accreditation Standards

9.1 Specialized Accreditation

10 Resource Request/Adjustment

BudgetChart [XLS 2,000 KB 9/23/14]

10.1 Long-range Adjustment to Resources

The Electronics program is currently implementing a realignment involving the establishment of new classes to replace some of the existing ones. This should, in general, require the same levels of budget support as current levels, allowing for typical increases due to inflation and/or increasing enrollment.

Two areas will, if implemented as listed in the aforementioned long and short term goals above, require as yet to be determined levels of start-up and maintenance costs:
- Adding at least one new fulltime faculty member, to allow better coordination and continuity of the existing areas of analog, digital and industrial electronics
- Increasing Chair Release Time from 2 to 4 hours
- Establishment of new areas in Photonics, Industrial Robotics and Medical Electronics

10.2 Educational Technology Support

With Desire 2 Learn (D2L) becoming increasingly important in the classroom, even for traditional classes, the Education Tech Center is of great importance in training and supporting the faculty in D2L's use.

End of report