

# Program Efficacy Report

## Electricity/Electronics

Submitted by Professor Ed Szumski  
Department Head, Electricity/Electronics

March 2013

## **INSTITUTIONAL PROGRAM REVIEW 2012 – 2013**

### **Program Efficacy Phase: Instruction**

#### **Purpose of Institutional Program Review**

Welcome to the Program Efficacy phase of the San Bernardino Valley College Program Review process. Program Review is a systematic process for evaluating programs and services annually. The major goal of the Program Review Committee is to evaluate the effectiveness of programs and to make informed decisions about budget and other campus priorities.

The Institutional Program Review Committee is authorized by the Academic Senate to develop and monitor the college Program Review process, receive unit plans, utilize assessments as needed to evaluate programs, recommend program status to the college president, identify the need for faculty and instructional equipment, and interface with other college committees to ensure institutional priorities are met.

The purpose of Program Review is to:

- Provide a full examination of how effectively programs and services are meeting departmental, divisional, and institutional goals
- Aid in short-range planning and decision-making
- Improve performance, services, and programs
- Contribute to long-range planning
- Contribute information and recommendations to other college processes, as appropriate
- Serve as the campus' conduit for decision-making by forwarding information to or requesting information from appropriate committees

Our Program Review process is two-fold. It includes an annual campus-wide needs assessment in the fall, and an in-depth review of each program every three years that we call the Program Efficacy phase. Instructional programs are evaluated the year after content review, and every three years thereafter, and other programs are placed on a three-year cycle by the appropriate Vice President.

Two or three committee members will be meeting with you to carefully review and discuss your document. You will receive detailed feedback regarding the degree to which your program is perceived to meet institutional goals. The rubric that the team will use to evaluate your program is embedded in the form. When you are writing your program evaluation, you may contact efficacy team assigned to review your department or your division representatives for feedback and input. The list of readers is being sent to you with these forms as a separate attachment.

Draft forms are due to the Committee Chair and Division Dean by Thursday, February 28, 2013, so that your review team can prepare comments for the draft review meeting (March 1 and/or March 8). Final documents are due to the Committee Chair by Friday, March 29, 2013 at midnight.

*It is the writer's responsibility to be sure the Committee receives the forms on time.*

In response to campus-wide feedback that program review be a more interactive process, the committee piloted a new program efficacy process in Spring 2010 that included a review team who will provide feedback and/or tour a program area during the efficacy process. Another campus concern focused on the duplication of information required for campus reports. The efficacy process will incorporate the Educational Master Plan One-Page Summary (EMP Summary) and strive to reduce duplication of information while maintaining a high quality efficacy process.

## Program Efficacy 2012 – 2013

Complete this cover sheet as the first page of your report.

**Program Being Evaluated**

Electricity/Electronics

**Name of Division**

Applied Technology, Transportation, and Culinary Arts

**Name of Person Preparing this Report**

Edward J Szumski

**Extension**

8501

**Names of Department Members Consulted**

C. Busselle, G. Chase, S. Valle, C. Monin, G. Graham, D. Hotchkiss, W. Montgomery, N. Leighton, D. Ebarra, S. Chow, M. Romero

**Name of Reviewers**

Romana Pires, Geoff Schroder

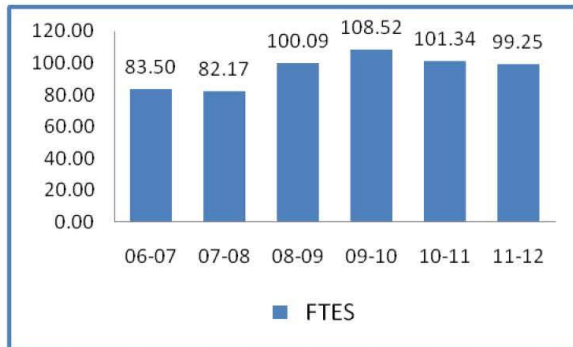
Work Flow	Due Date	Date Submitted
Date of initial meeting with department	February 11 -15, 2013	February 14, 2013
Final draft sent to the dean & committee	February 28, 2013	February 28, 2013
Report submitted to Program Review Team	February 28, 2013	February 28, 2013
Meeting with Review Team	March 8, 2013	March 8, 2013
Report submitted to Program Review co-chair	March 29, 2013	March 29, 2013

**Staffing**

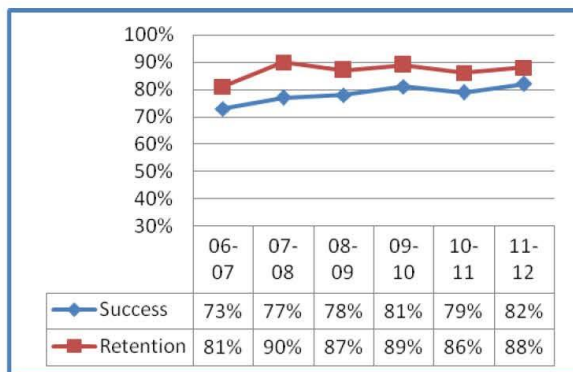
List the number of full and part-time employees in your area.

Classification	Number Full-Time	Number Part-time, Contract	Number adjunct, short-term, hourly
Managers	0	0	0
Faculty	1	0	11
Classified Staff	0	0	0
<b>Total</b>	1	0	11

## Electronics & Electric Technology - 2012



	06-07	07-08	08-09	09-10	10-11	11-12
Duplicated Enrollment	634	591	752	791	755	738
FTEF	6.31	7.90	8.02	8.09	7.57	6.96
WSCH per FTEF	397	310	374	402	402	427



	06-07	07-08	08-09	09-10	10-11	11-12
Sections	30	36	38	37	32	29
% of online enrollment	0%	0%	0%	0%	0%	0%
Degrees awarded	6	9	8	8	11	13
Certificates awarded	21	40	17	28	30	18

### Description:

The Electricity/Electronics Department prepares students for employment as entry level Electricians, Electronic Technicians, or Avionics Technicians. Students who seek a Certificate or an AS Degree in Electricity or Electronics complete a series of core courses common to Electricity & the National Electrical Code, Telecommunications & Data Networking, Computer Repair Fundamentals, and Avionics. Some of these courses are articulated with 4-year university for a BS in Engineering Technology

### Assessment

- Enrollment was increasing till 2010 and then fell due to cuts in number of sections offered
- WSCH/FTEF has increased by 37.8% and the FTEF has decreased by 16.2%
- The student success rate averages 79.4%
- The program ranks at #6 in the amount of certificates awarded at SBVC
- Student retention averages 88% which is much better than the college average

### Program Goals:

- Increase the number of sections offered so that students can complete their chosen certification program within three or four semesters
- Increase the number of women in the program
- Hire a full time faculty member with Green tech experience
- Increase the number of students transferring to four-year universities
- Update the curriculum to include Green and Sustainable technology

### Challenges and Opportunities:

- The rapid rate of change in Green and Sustainable technologies and the corresponding changes in law requires less dependence on energy and more efficient equipment
- The department needs more laboratory space to effectively teach the solar (Photovoltaic) class
- Ability to meet with STEM groups is limited. We have only one full time faculty
- It takes sustained long term effort to recruit women as they are not traditionally attracted to the program

### Action Plan:

- Provide adjunct and full time faculty with opportunities to train and stay current with the emerging technologies
- The Dept. Chair will contact STEM group on campus to inform prospective students about the opportunities for employment after successful completion of a certificate
- Actively work with local employers to help students obtain internship positions to enable them to have on-the-job experience in the field
- Hire a new faculty member

## Part I: Questions Related to Strategic Initiative: Access

Use the demographic data provided to describe how well you are providing access to your program by answering the questions below.

Strategic Initiative	Institutional Expectations	
	Does Not Meet	Meets
<b>Part I: Access</b>		
Demographics	The program does not provide an appropriate analysis regarding identified differences in the program's population compared to that of the general population	The program provides an <u>analysis</u> of the demographic data and provides an interpretation in response to any identified variance.  If warranted, discuss the plans or activities that are in place to recruit and retain underserved populations.
Pattern of Service	The program's pattern of service is not related to the needs of students.	The program provides <u>evidence</u> that the pattern of service or instruction meets student needs.  If warranted, plans or activities are in place to meet a broader range of needs.

Program: Electricity/Electronics	Demographics Fall 2009 – Fall 2012	Campus
3.8%	Asian	6.2%
16.2%	African-American	20.3%
49.3%	Hispanic	48.6%
1.4%	Native American	1.0%
0.3%	Pacific Islander	0.7%
26.4%	White	21.0%
2.7%	Other/Unknown	2.1%
6.1%	Female	54.6%
93.9%	Male	45.2%
5.4%	Disability	5.4%
Min: 18	Age	Min: 15
Max: 76		Max: 88
Avg: 32.77		Avg: 29.47

Does the program population reflect the college's population? Is this an issue of concern? If not, why not? If so, what steps are you taking to address the issue?

Analysis of the demographic data shows that, overall, our students in the Electrical/Electronics department courses reflect the composition of students on the San Bernardino Valley College campus. Overall, our department student population nearly is identical to the campus student population. It is comprised of students with ethnically diverse backgrounds with the majority population of Hispanic ethnicity nearly equal to the general campus population. The San Bernardino City Unified School District is a Hispanic-Serving School District (HSSD) and perhaps our student population reflects the percentage of students our department recruits from area high schools. The only major area of concern is the very low proportion female students. There are more than nine times the number of female students in the campus population over our department female population. Almost all of the electrical/electronics occupations listed on the **“Nontraditional Employment for Women”** Civilian Labor Force by Occupation and Sex shows less than 25% of those occupations are held by women. The entries in **BOLD** show the occupations where women are **less than 25%** of the workforce (see report on the next page). Total percentages in the “Need” column are for men and women. We are highly committed to increasing female enrollment in our courses and programs. To address this issue nationally, a bill was introduced in Congress that addressed this inequality. H. R. 4830: To promote the economic self-sufficiency of low income women through their increased participation in high-wage, high demand occupations where they currently represent 25 percent or less of the workforce. SEC. 2 (7) FINDINGS “Women make up 95.6 percent of child care workers, whose hourly wage averages \$9.79, but only 1 percent of electricians, who make an average hourly wage of \$23.98” Over a lifetime, a woman makes \$629,216 and an electrician makes \$1,510,080. This is a \$880,864 difference over a lifetime! Area employers are interested in balancing their workforces and are very interested in hiring our non-traditional students.

To address this issue locally, during this past three year period, my adjunct faculty members and I have to partnered with the Institute for Women in Trades, Technology & Science (IWITTS), Tradeswoman Inc., Nontraditional Careers Statewide Leadership Project, and Women In Non-Traditional Employment Roles (WINTER), and the Institute of Electrical and Electronic Engineers (IEEE) Women in Engineering Society to help expand the horizons for women to enter our high-wage, high-skill professions. We seek mentors for our entry-level electrical/electronics students and we are going to elementary and middle schools (5<sup>th</sup> and 6<sup>th</sup> grades) to show young girls that they can succeed in traditional male employment positions. Since Science, Technology, Engineering and Math (STEM) are part of our curriculum, I'll work with the STEM representatives to integrate our programs into their presentations.

Although we have very few disabled students, we do have strategies for physical accessibility to our classrooms. All doors are at least 36 inches wide. Lab tables and desks are at standard height and lab materials can be reached by someone in a wheelchair. Hearing impaired students can have copies of my board notes. I can make copies and/or send them .jpg pictures of the white boards in my classroom. Our DSPS office has worked with our department in the past with test accommodation and also they have provided our hearing impaired students with a captionist to record what I've said up in front of my class.

We also have incorporated strategies into our courses for the other “special population” students which include economically disadvantaged, single parent, and displaced homemaker students. These strategies include instructional support, tutoring, and career guidance which were suggested by the California Community College Special Populations Collaboration.

## Top 20 Industries Employing this Occupation in San Bernardino County

Items with the \* are for California listings

INDUSTRY TITLE	SOC Code	Total #	Need
<b>Electricians (635)</b>	<b>47-2111</b>	<b>4,000</b>	<b>13.0%</b>
<b>Electronic Equipment Installers and Repairers, Motor</b>	<b>49-2096</b>	<b>250</b>	<b>4.0%</b>
<b>Security and Fire Alarm Systems Installers (713)</b>	<b>49-2098</b>	<b>590</b>	<b>28.8%</b>
<b>Electrical Power-Line Installers and Repairers (741)</b>	<b>49-9051</b>	<b>930</b>	<b>22.6%</b>
<b>Electronic Home Entertainment Equipment Installers and Repairers (712)</b>	<b>49-2097</b>	<b>3,400*</b>	<b>9.7%</b>
<b>Home Appliance Repairers</b>	<b>49-9031</b>	<b>3,500*</b>	<b>14.3%</b>
<b>Avionics Technicians (703)</b>	<b>49-2091</b>	<b>110</b>	<b>27.3%</b>
<b>Telecommunications Line Installers and Repairers (742)</b>	<b>49-9052</b>	<b>2,970*</b>	<b>5.7%</b>
<b>Power Plant Operators, Distributors, and Dispatchers (860)</b>	<b>51-8010</b>	<b>No data</b>	<b>No data</b>
<b>Electrical and Electronics Engineers (141)</b>	<b>17-2070</b>	<b>No data</b>	<b>No data</b>
Electrical and Electronics Repairers, Commercial (710)	<b>49-2094</b>	<b>550</b>	<b>1.8%</b>
<b>Miscellaneous Engineers, Including Agricultural and Biomedical (153)</b>	<b>12-2031</b>	<b>3,100*</b>	<b>32.3%</b>
<b>Broadcast and Sound Engineering Technicians and Radio Operators and Other Media and Communication</b>	<b>27-40XX</b>	<b>No data</b>	<b>No data</b>
<b>Radio and Telecommunications Equipment Installers and Repairers (702)</b>	<b>49-2020</b>	<b>No data</b>	<b>No data</b>
<b>Radio Mechanics</b>	<b>49-2021</b>	<b>No data</b>	<b>No data</b>
<b>Telecommunications Equipment Workers, Except Line</b>	<b>49-2022</b>	<b>1,900</b>	<b>3.20%</b>
<b>Engineering Technicians, Except Drafters (155)</b>	<b>17-3020</b>	<b>No data</b>	<b>No data</b>
Computer Support Specialists (104)	15-1041	3,250	18.5%
Electrical, Electronics, and Electromechanical Assemblers	51-2023	230	17.4%
<b>Computer, Automated Teller, and Office Machine Repairers</b>	<b>49-2011</b>	<b>1090</b>	<b>8.30%</b>

### Pattern of Service

How does the pattern of service and/or instruction provided by your department serve the needs of the community? Include, as appropriate, hours of operation/pattern of scheduling, alternate delivery methods, weekend instruction/service.

### Hours of Operation/pattern of scheduling

Our classes are primarily taught in the late afternoon (3:30 p.m. or 4:30 p.m.) and evenings (6:00 p.m.) or on Saturday morning and afternoon. Our students can work in the electrical/electronics field as Electrician Trainees during the day and still complete their certificate requirements within four semesters. Our department brochures contain a flowchart which shows the layout of courses in the proper order in which our students should enroll with the prerequisites having been met in the prior semester (see next page). This is something I wish I had when I was a student here at SBVC back in the early 1970's when we only had the catalog and schedule of classes. A student would know what courses to take, but never knew when the classes were offered. For our third and fourth semester classes, the pattern alternates between Friday and Saturday, Fall and Spring semesters. Brochures for all of our department certificate programs have a sequential semester flowchart (see next page) which shows a student how to complete a certificate within three or four semesters depending on the program. Prerequisites are met in the prior semester.

### Alternate Delivery Methods

There are two courses (ELECTR 230 and ELECTR110) that are planned to be taught in an on-line format during the 2013-14 academic year.

### Weekend instruction/services

Classes are also taught on Friday evenings and on Saturdays during the fall and spring semesters to help our students complete their certificate(s) within three or four semesters depending on which of the five associate degrees or six certificate programs our students want to complete.

Shown here is an Education Plan (tentative, so check the class schedule) for completion for the courses necessary to sit for the California State General Electrician Certification examination. Courses are taught in the evenings or on Saturdays. The anticipated cost per college unit is only \$46.00 and classes begin in mid-August. Start right now by visiting the SBVC web site [www.valleycollege.edu](http://www.valleycollege.edu) and complete the [Application for Admission](#) today. Registration for FALL semester classes begins in late June.

## SAN BERNARDINO VALLEY COLLEGE GENERAL ELECTRICIAN CERTIFICATION PROGRAM FALL - SPRING

1 <sup>st</sup> Semester FALL	2 <sup>nd</sup> Semester SPRING	3 <sup>rd</sup> Semester FALL	4 <sup>th</sup> Semester SPRING
<p>ELECTR 110 3 Units Direct Current Circuit Analysis W 6:00 - 8:50 p.m.</p> <p>ELECTR 111 1 Unit Direct Current Circuits Lab W+Th 4:30 - 5:50 p.m. <b>OR</b> Th 6:00 - 8:50 p.m.</p> <p>TECALC 087 4 Units Technical Calculations S 9:00 a.m. - 12:50 p.m.</p> <p>ELECTR 265 4 Units Digital Logic Design M+T 6:00 - 8:50 p.m.</p>	<p>ELECTR 115 3 Units Alternating Current Circuit Analysis W 6:00 - 8:50 p.m.</p> <p>ELECTR 116 1 Unit Alternating Current Circuit Laboratory Th 4:00 – 6:50 p.m. <b>OR</b> Th 7:00 p.m. – 9:50 p.m.</p> <p>ELECTR 230 3 Units Semiconductor Devices M+T 4:30 – 5:50 p.m.</p> <p>ELEC 216 4 Units Introduction to Industrial Electricity M+T 6:00 – 8:50 p.m.</p> <p>ELEC 090 2 Units OSHA Construction Safety F 6:00 – 9:00 p.m.</p>	<p>ELEC 217 4 Units Industrial Electricity W+Th 6:00 -8:50 p.m.</p> <p>INSPEC 014 3 Units Advanced Construction Inspection: National Electrical Code Check Schedule</p> <p>INSPEC 024 3 Units Community Relations for Civil Service Employees Check Schedule</p>	<p>ELECTR 235 4 Units Solid State Circuit Analysis M+T 6:00 – 8:50 p.m.</p> <p>ELEC 218 4 Units Controlling Industrial Electricity S 9:30 a.m. – 3:50 p.m.</p> <p>PE231 3 Units First Aid and CPR Check Schedule</p>
12 Units	13 Units	10 Units	11 Units



## Part II: Questions Related to Strategic Initiative: Student Success

Strategic Initiative	Institutional Expectations	
	Does Not Meet	Meets
<b>Part II: Student Success - Rubric</b>		
Data demonstrating achievement of instructional or service success	Program does not provide an adequate <i>analysis</i> of the data provided with respect to relevant program data.	Program provides an <u>analysis</u> of the data which indicates progress on departmental goals.  If applicable, supplemental data is analyzed.
Student Learning Outcomes and/or Student Achievement Outcomes	Program has not demonstrated that they have made progress on Student Learning Outcomes (SLOs) and/or Service Area Outcomes (SAOs) based on the plans of the college since their last program efficacy.	Program has demonstrated that they have made progress on Student Learning Outcomes (SLOs) and/or Service Area Outcomes (SAOs) based on the plans of the college since their last program efficacy.

Provide an analysis of the data and narrative from the program's EMP Summary and discuss what it reveals about your program. (Use data from the Charts 3 & 4 that address Success & Retention and Degrees and Certificates Awarded" on page 3 of this form.)

Analysis of the data shows that the student retention rate **averages 86.8%** with 90% for the high and 81% for the low. In the areas where there were dips in the student retention portion shows primarily the Certified Electricians who took one or two of our course(s) to complete their required hours of Continuing Education needed every three years. Our students are motivated to stay in our program because of our department policy of designing a course "Ed Plan" (on the previous page) so the students know which classes can be taken and meet the prerequisites of the classes for the following semester. Our students can finish any of our certificate programs in four semesters! Our entry-level courses Direct Current Circuit Analysis lecture and lab and Alternating Current Circuits lecture and lab are transferable to the University of California and the California State University in their Electrical Engineering programs.

Our electricity/electronics program does a very good job of training and retaining our students. The electricity/electronics program is growing due to the need for certified electricians and a great interest in solar (photovoltaic) panel installers. Certified electricians are also required to complete 32 hours of continuing education (CE) every three years and this will keep our program growing. Our students also need two Inspection classes (014 and 024) provided by other departments on campus and our new OSHA (ELEC 090) class. The number of certificates will increase because the student must complete the general electrician's certificate to be allowed to sit for the statewide electrician certification examination.

The student success rate averages 78.3% with 82% for the high and 73% for the low. Our courses do have academic rigor because they are articulated with CSUs and UCs. We are awarding about 9 Associate Degrees per year and an average of 25 certificates per year. Our program ranks number 6 on the top ten list of certificates awarded at San Bernardino Valley College.

## Supplemental Data

Provide any additional information, such as job market indicators, standards in the field or licensure rates that would help the committee to better understand how your program contributes to the success of your students.

<p>Job market related to their majors or certificates: (resource: California Employment Development Department EDD)</p>	<p>There are jobs available in our local area. I'll use the local (<b>San Bernardino</b>) labor statistics.            Typical median wages are \$29.59 per hour.</p> <table border="0"> <tr> <td>Electrical Power-line Installers</td> <td>22.6% increase</td> </tr> <tr> <td>Avionics Technicians</td> <td>27.3% increase</td> </tr> <tr> <td>Electrical and Electronics Repairers</td> <td>25.4% increase</td> </tr> <tr> <td>Electricians</td> <td>13.0% increase</td> </tr> <tr> <td>Security &amp; Fire Alarm installers</td> <td>28.8% increase</td> </tr> <tr> <td>Telecommunications Line installers</td> <td>5.7% increase</td> </tr> <tr> <td>Home Appliance Repairers</td> <td>14.3% increase</td> </tr> </table>	Electrical Power-line Installers	22.6% increase	Avionics Technicians	27.3% increase	Electrical and Electronics Repairers	25.4% increase	Electricians	13.0% increase	Security & Fire Alarm installers	28.8% increase	Telecommunications Line installers	5.7% increase	Home Appliance Repairers	14.3% increase
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<p>Standards in the field</p>	<p>Standards of acceptance are stated in the National Electrical Code for all electrical circuitry, installation and their placement. Our students must also complete the ELEC 090 course, the OSHA 30-Hour Safety Standards for Construction and Industry and carry their authorization card on the job site. Our students who complete our solar fundamentals course must pass the North American Board of Certified Energy Practitioners (NABCEP) certification exam for work in the this industry. Students in our Communications Engineering Technology program will prepare to pass to Federal Communication Commission General Radiotelephone Operator License (GROL) examination.</p>														
<p>Labor and other statistics (national, western states, regional)  <a href="http://www.labormarketinfo.edd.ca.gov">www.labormarketinfo.edd.ca.gov</a></p>	<p>Typical jobs require installing, testing, adjusting, repairing, and calibrating electrical equipment or cables in electrical power or distribution systems or subsystems. See the chart of electricity/electronics jobs in the local are on page 6 of this report.</p>														
<p>Comparison colleges</p>	<p>We are one of six community colleges in <b>all of southern California</b> that teaches the "Whole" General Electrician Certification program.</p>														

<p>Job Placement</p>	<p>There is no Job Placement data attached to the e-mail you sent me to complete this document. Typically, electrical contractors and area electrical businesses contact us and ask for student referrals. I ask the company for their e-mail and/or website address and I have our students e-mail their current resume to the company which then contacts each student about scheduling job interviews for jobs.</p>
<p>Licensure rates</p>	<p>Many of our students are authorized “Electrician Trainees” according to the California Division of Apprenticeship Standards and we will continue to see electrician certification rates increase. <a href="http://www.dir.ca.gov/DAS/ElectricalTrainee.htm">http://www.dir.ca.gov/DAS/ElectricalTrainee.htm</a>. Nine of our Communication Engineering Technology students successfully passed the Federal Communications Commission General Radiotelephone Operator License exams.</p>
<p>Advisory Committee Recommendations</p>	<p>Our advisory committee discussed increasing the number of Agreen@ courses (environmental and energy saving and sustainability courses) to our curriculum. Discussion included wind energy, solar panels, LED lighting systems and related technologies. Residential Electrical Systems Integration (RESI) certification information has been integrated into our ELEC 216C course along with sustainable energy Agreen technology@ information in some of our other courses. The advisory committee has recommended adding a certificate for biomedical equipment technicians. We are also looking into the emerging technology of RFID (Radio Frequency Identification) technologies which are widely used in warehousing and parts location and distribution for inclusion in our ELECTR 250C Radio Transmitters, Receivers and Antennas class. Members attending the Aeronautics Advisory committee meetings have recommended training avionics specialists since most of the analog circuitry associated with “old” technology is being replaced by the newest digital “Fly-by-wire” technology.</p>

## **Student Learning Outcomes and/or Student Area Outcomes**

Demonstrate that your program has continued to make progress on Course Student Learning Outcomes (SLOs) and/or Service Area Outcome (SAOs) based on the plans of the college since the program's last efficacy report. Describe how the SLOs are being used to improve student learning (e.g., faculty discussions, SLO revisions, assessments, etc.).

See [Strategic Initiative 5.1](#)

Our first topic of discussion at our Electricity/Electronics advisory committee meetings after our introductions is discussion of our program Student Learning Outcomes (SLOs) and the course content. The electrical contractors on the advisory committee, and the electrical engineers and technicians, and the biomedical technicians review our course outlines and SLOs. All agree that we are covering all of the material that meets the entry-level criteria for employment. Our department adjunct faculty attend this advisory meeting also and contribute to the discussion of our department goals and we meet separately as a group to analyze the SLO assessment results and we've implemented some very minor revisions in the courses, not the SLOs, that we teach. Our department SLOs were carefully written in 2007 and we continuously evaluate our SLOs when scheduled and make minor course revisions as necessary. See pages 21 – 23 for the advisory committee minutes for spring 2013.

Describe how the SLOs are being used to improve student learning at the program level (e.g., faculty discussions, SLO revisions, assessments, etc.). If your program offers neither a degree nor a certificate, describe how the course SLOs are mapped to the core competencies.

See [Strategic Initiative 5.1](#)

Our adjunct faculty and I discuss our program Student Learning Outcomes (SLOs) along with the course content and the also the SLOs for our 5 associate degree programs and our 6 certificate programs. Our department full time and adjunct faculty discuss our department goals and analyze the SLO assessment results and evaluate the attainment of SLOs in the courses we teach. We have a process for continuously evaluating and implementing changes, if necessary. We annually review and analyze SLO assessment outcome data to verify SLO progress in meeting targeted outcomes. We've implemented some very minor revisions in the courses, not the SLOs, we teach. As an example of data taken from one of our classes taught in the fall 2011 semester shows that 38 successfully completed ELECTR 110 with an overall score of 70% or higher, which is a requirement for our certificate program. Four students received an I (incomplete) and six students withdrew prior to the withdraw date. This result is common to all of the courses we teach in our program.

We have considered having our students take a nationally normed examination as a measure of our student success. The Electronics Technicians Association (ETA), the Society of Manufacturing Engineers (SME), and the International Association for Radio, Telecommunications and Electromagnetics (iNARTE) offer outcome assessments which cover all the areas covered by our electronics curriculum.

### Part III: Questions Related to Strategic Initiative: Institutional Effectiveness

Strategic Initiative	Institutional Expectations	
	Does Not Meet	Meets
<b>Part III: Institutional Effectiveness – Rubric</b>		
Mission and Purpose	The program does not have a mission, or it does not clearly link with the institutional mission.	The program has a mission, and it links clearly with the institutional mission.
Productivity	The data does not show an acceptable level of productivity for the program, or the issue of productivity is not adequately addressed.	The data shows the program is productive at an acceptable level.
Relevance, Currency, Articulation	<p>The program does not provide evidence that it is relevant, current, and that courses articulate with CSU/UC, if appropriate.</p> <p>Out of date course(s) that are not launched into Curricunet by Oct. 1 may result in an overall recommendation no higher than Conditional.</p>	<p>The program provides evidence that the curriculum review process is up to date. Courses are relevant and current to the mission of the program.</p> <p>Appropriate courses have been articulated or transfer with UC/CSU, or plans are in place to articulate appropriate courses.</p>

#### Mission and Purpose:

*SBVC Mission: San Bernardino Valley College provides quality education and services that support a diverse community of learners.*

What is the mission statement of the program?

The purpose of the Electricity/Electronics Department is to offer curriculums designed to prepare students to be employed at an introductory level in the fields of Electricity and/or Electronics. The curriculum consists of Electronics Technology, Communications Engineering Technology, Computer Engineering Technology, Avionics Technology, Electrical Power Technology, and the General Electrician Certification Program. Our curriculum is recognized and sanctioned by the International Association for Radio, Telecommunications and Electromagnetics (iNARTE) and our graduates are eligible for membership in this organization and can join with a Junior Technician Certification. Our Avionics curriculum is recognized by the Aircraft Electronics Association. We prepare our students for the work force under the advisement of our advisory committee and the employment needs as reflected by the Electrical Certification Curriculum Committee (ECCC), the Division of Apprenticeship Standards (DAS), the Employment Development Department (EDD) of California and the Occupational Health and Safety Administration (OSHA). Our department is also actively engaged with our local high

schools (Colton High School and San Bernardino City Schools) which have programs that articulate with our programs, and community and state electrical/electronics organizations to advance the state and region's economic growth and global competitiveness. We also prepare students to transfer to a number of public and private universities for further study in the various fields of Engineering, Engineering Technology, and Industrial Technology.

How does this purpose relate to the college mission?

The electricity/electronics department mission is the same as the college mission. We want our diverse community of learners to succeed! We train taxpayers! We provide our students a hands-on learning experience to accompany their ability to understand theory, the ability to think critically, and the capacity to apply that knowledge in a real-world setting. Our students do very well because we provide our diverse student population with quality training, skills and knowledge necessary to succeed in business, industry, and their chosen professions in a multicultural society. We have plans to increase the number of women coming into our electricity/electronic programs by attending career day activities at area middle schools to speak to those female students and show them that women can be technicians and engineers. I have posters, brochures, and DVD presentations that I've purchased from The Institute for Women In Trades, Technology and Science (IWITTS) to show and share with these future technology and engineering students.

### **Productivity**

Provide additional analysis and explanation of the productivity data and narrative in the EMP Summary, if needed. (Use data from charts 1 and 2 (FTEs; Enrollment; FTFE and WSCH per FTFE) on page 3 of this form). Explain any unique aspects of the program that impact productivity data for example; Federal Guidelines, Perkins, number of workstations, licenses, etc.

Analysis of the productivity data shows that the electricity/electronics program has excellent enrollment and provides the training needed by the students who transfer to engineering or engineering technology programs at electrical contractors and others who hire our students. Enrollment is up, retention is strong, completions and transfers are also strong. In the past 6 years, there has been a significant increase in FTES. The increase from 06-07 to 07-08 is 25.2%. There was a very slight decrease (only 8.7%) in the 10-11 academic year and the 11-12 academic year (another 8.7%) we in the department are due to the management mandated reduction in class offerings during that time. Over the past four years our department has averaged over **100 FTES**. Our productivity in relation to the Full-Time Equivalent Faculty has averaged **7.5 FTEF** for the past 6 years. Last year our FTEF was almost 7 which is a decrease of 8.7% over the 10-11 academic year. The average is almost 8 FTEF! We need to hire two new full time faculty members.

Our Weekly Student Contact Hours (WSCH) are below the college average due to laboratory equipment limitations and student safety concerns, but we've been increasing WSCH/FTEF each year since the 08-09 academic year and it now stands at **427**.

### Relevance and Currency, Articulation of Curriculum

If applicable to your area, describe your curriculum by answering the questions that appear after the Content Review Summary from Curricunet.

	Course	Status	Last Content Review	Next Review Date
	ELEC012 Utility Pole Climbing: OSPCTP	Active	03/03/2008	03/03/2014
	TECALC087 Technical Calculations	Active	03/03/2008	03/03/2014
	ELEC090 OSHA 30-Hour Safety Standards: Construction and Industry	Active	10/27/2009	10/27/2015
	ELEC091 Fundamentals of Solar Energy	Active	12/07/2009	12/07/2015
	ELECTR098 Electronics Work Experience	Active	11/23/2009	11/23/2015
	ELECTR110 Direct Current Circuit Analysis	Active	02/25/2008	02/25/2014
	ELECTR111 Direct Current Circuit Laboratory	Active	03/03/2008	03/03/2014
	ELECTR115 Alternating Current Circuit Analysis	Active	03/03/2008	03/03/2014
	ELECTR116 Alternating Current Circuit Laboratory	Active	03/03/2008	03/03/2014
	ELECTR155 Electronic Drawing and Assembly	Active	03/03/2008	03/03/2014
	ELEC216C Introduction to Industrial Electricity	Active	02/25/2008	02/25/2014
	ELEC217C Industrial Electricity	Active	02/25/2008	02/25/2014
	ELEC218C Controlling Industrial Electricity	Active	02/25/2008	02/25/2014
	ELECTR220C FCC Rules and Regulations	Active	09/22/2008	09/22/2014
	ELECTR230 Semiconductor Devices	Active	02/25/2013	In Curricunet
	ELECTR235 Solid State Circuit Analysis	Active	03/03/2008	03/03/2014
	ELECTR250C Radio Transmitters, Receivers and Antennas	Active	09/22/2008	09/22/2014
	ELECTR255C Telephone and Data Networking	Active	09/22/2008	09/22/2014
	ELECTR257C Navigation and Communication Systems	Active	09/22/2008	09/22/2014
	ELECTR265 Digital Logic Design	Active	09/22/2008	09/22/2014
	ELECTR266 Microprocessor Technology with Assembly Language	Active	09/22/2008	09/22/2014
	ELECTR270 Linear Integrated Circuit Analysis	Active	09/22/2008	09/22/2014
	ELECTR280C Computer Operation and Maintenance	Active	09/22/2008	09/22/2014
	ELECTR290C Industrial Computers and Robotics Maintenance	Active	09/22/2008	09/22/2014

The Content Review Summary from CurricUNET indicates the program's current curriculum status. If curriculum is out of date, explain the circumstances and plans to remedy the discrepancy.

The Content Review Summary from CurricUNET listed above is correct as printed with two exceptions. ELEC 012 shows Active, but it is in a Course Deletion status and should not appear in the next college catalog. ELECTR 230 is currently undergoing Content Review.

The screenshot shows the San Bernardino Valley's CurricUNET interface. On the left, there is a login section with fields for 'User Name' and 'Password', and an 'OK' button. Below the login fields are links for 'CurricUNET Home', 'Search', 'Course', 'Program', and 'Links'. The main content area is titled 'Course Search Results' and contains a table with two rows of results. The first row shows 'ELEC012 Utility Pole Climbing: OSPCTP \*Active\* \*\*Course Deletion\*\*' with a 'Nan Meechubot' user. The second row shows 'ELEC012 Utility Pole Climbing: OSPCTP \*Historical\* \*\*New Course\*\*' with 'SBVC SBVC' as the user. To the right of the table is a 'Legend' section with icons and labels for 'Course Impact Report', 'Course Outline Report', 'Course Changes Report', 'Requisite Advisory Report', 'Edit', and 'Copy'.

#### Articulation and Transfer

List Courses above 100 where articulation or transfer is <b>not</b> occurring	With CSU	With UC
	All of our ELEC and ELECTR courses numbered 100 and above are articulated and transfer to CSU for college credit.	Our ELECTR 110, 111, 115, and 116 courses are articulated for transfer to the UC Electrical Engineering Program. All other coursework in that UC Electrical Engineering Program is considered upper division and our courses will not articulate for transfer.

Describe your plans to make these course(s) qualify for articulation or transfer. Describe any exceptions to courses above 100.

I will be attending the Engineering Liaison Council (ELC) meeting during the second week in April 2013. The Engineering Liaison Council is an organization composed of representatives of engineering and engineering technology education throughout California and several other states.

The representatives are from colleges of engineering of the UCs, CSUs, private universities and California Community Colleges. The ELC is dedicated to strengthening and improving the quality of engineering education; it has been serving a very important and critical function in engineering education since 1947. The ELC continues to work on improving articulation between two- and four-year programs of engineering and engineering technology; ensuring uniformity of basic concepts in core courses; establishing up-to-date and accurate guidance information; and collecting statistics pertaining to the



numbers of incoming and completing engineering majors.

I will meet with representatives from the CSUs and UCs to continue a dialog on articulating our two new courses. Our new Solar Energy Fundamentals course (ELEC 091) and the Occupational Safety and Health Administration (OSHA) 30-Hour Safety Standards: Construction and Industry course (ELEC 090).

**Currency**

Follow the link below and review the last college catalog data.

<http://www.valleycollege.edu/academic-career-programs/college-catalog.aspx>

Is the information given accurate? Which courses are no longer being offered? (Include Course # and Title of the Course). If the information is inaccurate and/or there are listed courses not offered, how does the program plan to remedy the discrepancy?

The information listed on this website showing each certificate and associate degree is currently correct for all of the certificate and associate degrees for Electricity and Electronics.

**Part IV: Planning**

Strategic Initiative	Institutional Expectations	
	Does Not Meet	Meets
<b>Part IV: Planning – Rubric</b>		
Trends	The program does not identify major trends, or the plans are not supported by the data and information provided.	The program identifies and describes major trends in the field. Program addresses how trends will affect enrollment and planning. Provide data or research from the field for support.
Accomplishments	The program does not incorporate accomplishments and strengths into planning.	The program incorporates substantial accomplishments and strengths into planning.
Challenges	The program does not incorporate weaknesses and challenges into planning.	The program incorporates weaknesses and challenges into planning.

What are the trends, in the field or discipline, impacting your student enrollment/service utilization? How will these trends impact program planning?

The rapid rate of change in “Green” and sustainable technologies and the corresponding changes in laws concerning these topics which will require less dependence on energy and more efficient equipment. Other trends include increased use of solar (photovoltaic) energy systems and the need for certified solar installers. Governor Schwarzenegger signed SB-1, the “One Million Solar Roofs” initiative in 2007 and wants 1,000,000 roofs with solar panels installed in the next 6.5 years. That’s 150,000 roofs per year and an estimated need of 10,000 new installer jobs. Also the emerging technology of RFID (Radio Frequency Identification) uses in all warehouses to control assets. RFID will also be used in humans with the insertion of an RFID chip that contains emergency medical information and quite possibly your financial data according to information I’ve read from the Institute of Electrical and Electronic Engineers (IEEE). More new trends include new Avionics Systems using digital “Fly-by-Wire” databus technologies to replace older analog systems (Avionics Magazine, December 2012 and Avionics News Magazine, January 2013).

We are running out of laboratory space and we need more room to expand our solar (photovoltaic) installation program. We’ll need at least 400 square feet when we receive all of the ordered photovoltaic (solar) panels, the grid-tied inverter to connect the panels to the power grid, and the roof supporting installation equipment and parts.

I see only expansion in our program due to the statewide solar initiative and the required electrician certification that was enacted three years ago. Plus any new emerging technology such as RFID. Fiber Optic installers are still in demand (OSP Magazine, June 2009), with most cable/telephone companies installing fiber to the house (FTTH). Verizon’s FIOS is this type of fiber optic connection. I just had FIOS connected to my home internet and telephone systems. Even in a lagging economy, there is still a need for our students to fill vacant positions of employment in this era of depleted budgets.

I also actively work with local employers to help students obtain internship positions to enable them to have on-the-job experience in the field. Electrical contractors will call me and ask for names of students who can work as Electrician Trainees. I ask for the employer’s e-mail address or business web address and then I’ll tell all of my students to put together a resume and e-mail to the employer. Typically the employer will select three or four of the students to interview for the job. I can not find jobs for individual students because I may be accused of favoritism.

We need to hire a new faculty member to succeed me when I retire this May 24, 2013. We have a very large (over 400 duplicated head count) and successful electricity/electronics program, but with only adjunct faculty keeping it going, I do not believe that the department will survive.

### **Accomplishments and Strengths**

Referencing the narratives in the EMP Summary, provide any additional data or new information regarding the accomplishments of the program, if applicable. In what way does your planning address accomplishments and strengths in the program?

Our department has been recertified as a testing site for the International Association for Radio, Telecommunications, and Electromagnetics (iNARTE). One faculty member has completed the Residential Electrical Systems Integration (RESI) certification and two have completed the Occupational Safety and Health Administration (OSHA) training and are authorized to provide OSHA 10-hour or 30-hour construction safety training to our students and issue these lifetime safety cards to our students as required by the state Chancellor’s office for educational providers, OSHA, and area electrical contractors. We have articulation agreements with the UC

and CSU universities and also a 2+2 articulation agreement with Colton High School. I currently serve on the California statewide Industrial and Technical Education (ITE) Advisory Committee which combines educational institutions and business groups to define and describe better ways to increase productivity on the job site. There are three component groups: Manufacturing, Construction, and Transportation. I am part of the construction group because our General Electrician Certification Program has construction components. I have served on this statewide committee four the past 6 years.

**Challenges**

Referencing the narratives in the EMP Summary and/or your data, provide any additional data or new information regarding planning for the program. In what way does your planning address trends and weaknesses in the program?

There are challenges in budget and facilities. We have run out of room to offer new curriculum. We need at least another 400 ft<sup>2</sup> to expand our solar (photovoltaic) course. There are opportunities for our students in the expanding fields of sustainable “green” energy technologies. It takes sustained long term effort to recruit women as they are not traditionally attracted to our electricity/electronics program, but are working on increasing the number of women in our classes (see page 6 for nontraditional students). My discussions with personnel from Southern California Edison indicated that they want to hire more women so they can balance their workforce. My ability to meet with STEM groups is limited since I am the only full time faculty member.

**V: Questions Related to Strategic Initiative: Technology, Campus Climate and Partnerships**

Strategic Initiative	Institutional Expectations	
	Does Not Meet	Meets
<b>Part V: Technology, Partnerships &amp; Campus Climate</b>		
	<p>Program does not demonstrate that it incorporates the strategic initiatives of Technology, Partnerships, or Campus Climate.</p> <p>Program does not have plans to implement the strategic initiatives of Technology, Partnerships, or Campus Climate</p>	<p>Program demonstrates that it incorporates the strategic initiatives of Technology, Partnerships and/or Campus Climate.</p> <p>Program has plans to further implement the strategic initiatives of Technology, Partnerships and/or Campus Climate.</p>

Describe how your program has addressed the strategic initiatives of technology, campus climate and/or partnerships that apply to your program. What plans does your program have to further implement any of these initiatives?

### **Technology**

We use many technological methods of instruction to teach our students the applicable course material. We use PowerPoint presentations developed by our faculty along with other sources. All of our lecture/lab classrooms have TV monitors and dual VHS and DVD players. We have purchased new Programmable Logic Controllers (PLCs) that allow our ELEC 218 students to improve their skills in robotics and machine control. This class uses computer integrated software so students can design programs for use with the programmable logic controllers (PLCs). We've purchased a 10-site license for the MultiSim electrical/electronic software that is loaded on our computers in the Technical Learning Center computers. Our students can design electrical and electronic circuits, run simulations, and have the software program design a printed circuit board. Our electricity/electronics classes are taught in accordance with the National Electrical Code (NEC), with other agencies such as the International Association of Radio, Telecommunications and Electromagnetics (iNARTE) where applicable. Our student graduates are eligible for the Junior Technician category from iNARTE upon graduation from our program. We share information from many sources such as the Institute of Electrical and Electronic Engineers (IEEE) with our students. Our most current purchase of solar (photovoltaic) panels will allow us to provide our students training required for the North American Board of Certified Energy Practitioners (NABCEP) certification. During this academic year, our department received a donation (\$12,000) of a robotic control computer, software, and controls. We also have the grid-tied converter and other remaining equipment needed to allow our students to connect our solar panels to the electrical grid, a function necessary for the North American Bureau of Certified Energy Practitioners (NABCEP) certification.

### **Campus Climate**

We've purchased a large banner that emphasizes the electrician certification program. We hope to increase the appeal of the solar program by showing the "Green" technology we're supporting here at SBVC. Our classrooms have been converted to lecture/labs rather than just labs to give the students the feel of a working environment. We would like the college to place solar panels above the campus parking lots. The solar panels would shield the cars from the sunlight (like a carport) and generate massive amounts of FREE energy that the college could use or sell back to the utility company. Our students could work as interns with the contractors and gain experience on the placement, installation, and operation of solar (photovoltaic) panels. This arrangement is called a Power Purchase Agreement (PPA), where the college spends no money for any of the equipment, but agrees to purchase power from the solar vendor.

### **Partnerships**

We prepare our students for the work force under the advisement of our advisory committee and the employment needs as reflected by the Electrical Certification Curriculum Committee (ECCC), the Division of Apprenticeship Services (DAS), and the Employment Development Department (EDD) of California. We also have an agreement with the Mountain View Power Plant for a tour of the plant to show our students what that job entails. Southern California Edison is very interested in using our students as a pool of available workers instead of recruiting nationwide. We are in the process of developing a Memorandum of Understanding (MOU) with SCE to act as their training site. This is a win-win situation.

## VI: Previous Does Not Meets Categories

Reference your most recent Program Efficacy document, and list below those areas which previously received "Does Not Meet." Then, either describe below how your program has remedied these deficiencies, or, if these areas have been addressed elsewhere in this current document, provide the section where these discussions can be located.

There were two areas where our previous Program Efficacy document had clear **DOES NOT MEET** areas:

**Productivity: Efficacy Team Analysis and Feedback: DOES NOT MEET:** The programs WSCH/FTEF is between 300 -400 due to the laboratory nature of the course, according to the program. I think this is an area of improvement for the program. Most CTE programs, in my experience, can achieve an efficiency ratio over 400 with sufficient enrollment.

**Department remedy:** Our WSCH per FTEF has been over 400 for the past three semesters and is currently at **427**. (See paragraph on page 14 under Productivity)

**Weaknesses/Challenges: Efficacy Team Analysis and Feedback: DOES NOT MEET:** The program does not identify its weaknesses nor link them to planning effectively.

**Department remedy:** The Educational Master Plan (EMP) we used in 2010 was very brief areas on the Challenges and Opportunities and the Action Plans. The current information on our department EMP is up to date and is much more comprehensive. See pages 18 – 20 for the discussions on these topics.

San Bernardino Valley College Electricity/Electronics Department

### Advisory Committee Minutes, April 3, 2012

#### Attendees:

Ed Szumski, Professor, Department Head Electricity/Electronics  
Carlos Busselle, Professor Emeritus, Electricity/Electronics, SBVC  
Bill Montgomery, County of Riverside (Telecommunications)  
Craig Monin, President, Lon's Electric Service  
Dr. Edd Ashley, School of Allied Health Programs, Loma Linda University  
Nita Leighton, Adjunct faculty, CFO, NDP Corp.  
Glen Graham, President of NPD Corp. (by mail)  
David Ebarra, Telecommunications Engineer, City of Moreno Valley  
Achala Chatterjee, Dean, Technical Division

Mr. Szumski opened the meeting at 6:00 p.m., with pizza, and beverages followed by introductions of all members attending. Ed Szumski, Department Head, Electricity/Electronics, began the discussion by reviewing our Student Learning Outcomes (SLOs) and department brochures which include the Programs, Certificates, Degrees, and Electricity and Electronics at San Bernardino Valley College including our General Electrician Certification Program requirements.

Mr. Szumski provided details of San Bernardino Valley College's connection with the statewide "Electrician Trainee" certification program and how the OSHA requirements course will be included in the course curriculum for the General Electrician Certification Program. I also reviewed the Electricity 091 class (solar) which will be taught for only the second time in the Fall 2012 semester.

We then went into a general discussion of interested topics and needed changes. Mr. Monin would like to see some more advanced curriculum in the ELEC 216 coursework along with newer technologies such as LED lighting systems and we still need more room to expand with our addition of solar (photovoltaic) fundamentals. He also suggested better security for the equipment and parts for our ELEC 216 and ELEC 217 classes. Mr. Szumski will look into the purchase of a cage like those in rooms T-109A and T-107A. Danny Hotchkiss (by mail) - suggested we try to get more of a variety of motors for the ELEC 217 class.

Nita Leighton for Glen Graham would like to see an intermediate and advanced PLC class and would like to see more electronics electives. Also our program should include coursework in microcontrollers and robotics. Mr. Busselle spoke to the instrumentation control and electrical section requirement for power plant and other uses and how these types of knowledge should be incorporated into our classes or a new class put together to cover this type of information. Nita Leighton spoke of adding a prerequisite of ELECTR 110 and ELECTR 111 for the ELEC 090, OSHA class. A general comment from the committee concerned the low number of women in our classes. Mr. Szumski will work with the STEM (Science, Technology, Engineer, and Math) group and work to recruit women into our classes.

The discussion then reflected past advisory committee discussions on how electricians should be skilled in the General Electrician Certification program and also have experience with fiber optic technologies, data and telephone networking fundamentals, and cable TV/satellite systems since all of these jobs are used in residential and industrial construction. Mr. Szumski mentioned that a few of our students have reported back that they work in the high desert for an avionics company. A small number of our students are asking about Biomedical Equipment Technician certification. We could put together a program of coursework and work with CSU Long Beach and/or Loma Linda University about transfer of units into their BS programs. According to the Bureau of Labor Statistics this field is expected to grow 27% by 2018, which is much faster than all other occupations (BLS, U.S. Department of Labor, *Occupational Outlook Handbook, 2010-2011 Edition*). Mr. Szumski will investigate these possibilities. Dr. Edd Ashley spoke of how our program graduates could benefit from entry into the BS/MS program in orthotics and prosthetics at Loma Linda University. Our students with an electronics and computer background could work well into this program because the newest prosthetic arms and legs use electronics/computers in their manufacture.

Mr. Szumski also mentioned that nine of our electricity/electronics courses transfer into the Electronics and Computer Engineering Technology Bachelor Degree at Cal Poly Pomona. Our program units also transfer into the Bachelor of Science Degree in Industrial Technology at CSU Los Angeles.

All of our advisory committee members spoke in favor of partnerships to link our community college with industry by requiring SBVC to reinstitute work experience and/or internship classes back into our course curriculum. The committee members agreed unanimously.

The meeting adjourned at 7:15 p.m. and everyone went on a tour of our electricity and electronics classrooms. Some of the advisory committee members were impressed at how much we teach in only four classrooms. Good meeting. Thanks to all that participated.

Sincerely,

Ed Szumski, Professor  
Department Head Electricity/Electronics/Refrigeration

enc: Meeting Agenda  
Sign in sheet