College of San Mateo

Program Review Submission

Instructional Program Review

Program Name: **Electronics Technology**
Program Contact: **Gonzales, Steven**
Academic Year: **2013-2014**
Status: **Submitted**

1. Description of Program

Provide a brief description of the program and how it supports the college's **College Mission and Diversity Statements**, **Institutional Priorities, 2008-2013**, **5 in 5 College Strategies, Spring 2011**, and other **Institutional Program Planning** as appropriate.

The Electronics Technology Program is a vocational technical program that supports the mission and priorities of the College of San Mateo by having an open access to class offerings and current programs. The courses are academically comprehensive and industry compliant with the skills and knowledge need to be employed in the electronics profession.

The Electronics Technology Program is student focused with hands on project based learning that educates a diverse student population to enter the field of Industrial Electronics at an apprentice or entry level position. The program works closely with our industrial partners to improve and update curriculum to have the most current and timely information needed to make our graduates attractive to hiring industries in the region. The curriculum that has been presented to the students is crafted to span 14 different industrial clusters allowing completers to pursue employment in many faucets of the industrial electronics job market.

Our faculty promotes the benefits an academically strong, student learning objectives driven program and does on–going outreach to high schools and job re-training programs in the surrounding community to inform and recruit possible future students. The faculty also explores teaching techniques such as; computer programs that allow students to test, build and trouble shoot circuits and electronic theory without expensive equipment or parts. The faculty has worked with the library to obtain reading material that is content appropriate in other languages to support our diverse population where English is a second language and more in-depth explanation is required outside of class meeting hours.

The program offers a 19 unit certificate that is CSM and state approved and currently is awaiting approval from the proposal that has been corrected and re-submitted to the state for an Associates of Science Degree in Industrial Electronics.

2. Student Learning and Program Data

A. Discuss Student Learning Outcomes Assessment

Reflect on recent SLO assessment results for courses and degrees and certificates offered by the program. Identify trends and discuss areas in need of improvement.

1. *A. Student Learning Outcomes Assessment*

Student Learning Outcome assessments and retention is on-going throughout the electronics course offerings. In ELEC 111 and ELEC 112 a pretest is given at the beginning of the semester and then used to evaluate student retention during each testing period. The questions from the pretests are re-worded or presented in a different scenario that would result in the same outcome if the student understands the concept that is being tested. ELEC 231 and ELEC 232 rely on periodic testing during the 16 week semester as well as weekly quizzes as a test for retention. ELEC 405, ELEC 421, and ELEC 441 use hands on laboratory experiments to test for understanding and retention.

As of the last program review an area of improvement that was addressed was the need to report the results for each course offered each semester. Every faculty member teaching a course(s) will report course retention and success percentages at the end of each semester so that the information can be entered in TracDat and reviewed by the faculty for updating course content and possible teaching techniques needed to improve student understanding, retention and success. All TRacDat data on each SLO should be examined and be 70% or greater. Each instructor needs to asses the course SLO's to check student **retetntion.**

B. Student Success Indicators

1. Review **Student Success and Core Program Indicators** and discuss any differences in student success indicators across demographic variables. Also refer to the **College Index** and other relevant sections of the **Educational Master Plan: Update, 2012**, e.g., Student Outcomes and Student Outcomes: Transfer. Basic Skills programs should also refer to **ARCC** data.

The Electronics program in the 2012-2013 school year reported varying student success; the 25-29 year old age group posted a (62.5%) which was a repeat of the 2011-2012 school year. This trend of repeating success rates was duplicated throughout the age groups. The highest success rate was the 40-49 year old age group with a success rate of (80.6%). The next highest success rate came from the +50 year old age group (79.1%) which historically is ways one of the top success rate performers. The 35-39 age group which comprises the average age of the programs night time students performed as serious career goal oriented student with a success rate of (75.6%).

Historically older students perform at a higher success rate. This seems to come from students who are more mature with life experiences that allow high retention that transposes to their work in class and in the lab.

Demographically the program has seen a small decrease in overall student success with students from ethnic and cultural minority groups and all students in general, however the decrease is less than 1% (.6%) from the 2011-2012 school year and can be attributed to on-going curriculum re-alignment. This curriculum re-alignment is what keeps the program current and up to industry standards.

2. Discuss any differences in student success indicators across modes of delivery (on-campus versus distance education). Refer to **Delivery Mode Course Comparison**.

1. The Electronics program does not offer any distance learning courses. The hands on project based learning content of this program requires on campus attendance for students to gain complete understanding of the information given through lecture, computer programs and lab experiments.

C. Program Efficiency Indicators. Do we deliver programs efficiently given our resources?

Summarize trends in program efficiency as indicated in the **Student Success and Core Program Indicators** (LOAD, Full-time and Part-time FTEF, etc.)

The Electronics program has one full time faculty and four part time faculty that total .54 Fion TE. This total of 1.54 FTE is needed to present the core courses required for the certificate offered by the Electronics Program. Our program has an overall retention percentage of 82.9% and a withdraw percentage of 17.1 %. Our small class size (ELEC 111 / ELEC 112 is 30 students max. and ELEC 405, 421 and 441is 24 students max.) is due to the hands on nature of labs and safety procedures that must be adhered to when working with voltages and currents.

3. Additional Factors

Discuss additional factors as applicable that impact the program, including changes in student populations, state-wide initiatives, transfer requirements, advisory committee recommendations, legal mandates, workforce development and employment opportunities, community needs. See **Institutional Research** as needed.

The Electronics Program has overcome challenges and obstacles over the last four years since the Electrical Pathways Program began in 2010. The health of the program is strong and growing and currently we are experiencing one of our largest enrollments to date.
Our graduates continue finding meaningful employment in the profession.

Our day time course offerings had been a concern in the areas of enrollment and retention over the last few school years, However, the faculty has been addressing these issues on a continual basis through recruiting at the regional high schools, regional job and college fairs and job re-training organizations. This tactic seems to be working as the last two semesters saw an increase in day time students retention and class offerings.

A cronic factor that still undermines the day time enrollment is the lack of CTE at the high schools. This factor forces the faculty to be creative and forward thinking when recuiting and informing the commuity that our program exists and is a pathway to a solid professional career.Our staff go to any community fuctions like the San Mateo fair or Jazz on the hill at CSM and any other event that would allow a venue to speak to the public about our program and all that it offers. Our Dean and the full time faculty both work with the Jefferson Unified School District as an advisor for their current CTE programs and how to create a pathway to the CTE programs at CSM.

4. Planning

A. Results of Program Plans and Actions

Describe results, including measurable outcomes, from plans and actions in recent program reviews.

During the 2012-2013 school year the faculty made small changes to the current curriculum in ELEC 111 AND ELEC 112 to bring them up to date to industrial standards and material costs. The Associate Degree proposal was returned to CSM for revisions twice over the last review period and has currently been re-submitted for approval. The faculty has been developing lesson plans and labs for the advance courses (ELEC 422, 424, 442 and 445) and will begin testing those lab and content during the summer break.

The program has re-organized the advisory council and will meet two times a year which will be supported with e-mail communications throughout the in between meetings to address recommendations and possible changes to courses or content.

The faculty is trying to standardize materials and content presented in the core courses by sharing lecture notes (power point presentations), worksheets, quizzes, tests, and projects so each student is receiving the same information that will help them build a solid foundation. ELEC 111 & ELEC 112 has had completed lab books created that include: labs, worksheets and handouts. This will help standardize the courses and present the content needed for advancement in future course work and employment opportunities.

B. Program Vision

What is the program's *vision* for sustaining and improving student learning and success over the next three years? Make connections to the **College Mission and Diversity Statements**, **Institutional Priorities, 2008-2013**, and other **Institutional Program Planning** as appropriate. Address discussion in the Student Learning and Program Data section: SLO assessment results and trends in student success indicators. [**Note**: Specific plans to be implemented in the next year should be entered in C of the Planning section.
CTE programs must address changes in the context of completion and employment rates, anticipated labor demand, and any overlap with similar programs in the area as noted in D1 and D2 of the Career Technical Education section.]

The Electronics Program's vision for the next six years is to continue to support the mission and priories of the college and continue to address and serve the needs of the regional electronics / electrical industrial community by promoting academic excellence in educating the regional community about the careers and opportunities available in industry and how to obtain them. (IPC Priority 2)

The program will continue to recruit high school graduates and underserved populations in the area to increase enrollment. The faculty will develop diverse teaching techniques and procedures to ensure student success and completion rates. Student success is one of the institutional priorities that the electronics program focuses on in each class offering by structuring courses to provide the most up to date information and faculty using conceptual project based learning and diverse teaching techniques. (IPC Priority 1)

Our course offerings will continue to be open access and faculty will be observing and updating curriculum mandated by industrial trends to maintain the college's cutting edge education for the 21st century. (IPC Priority 3)

1. To guide future faculty and staff development initiatives, describe the professional activities that would be most effective in carrying out the program's vision to improve student learning and success.

The Electronics Program supports personal enrichment opportunities for faculty members. Examples would be attendance at conferences or courses that enhance content or develop teaching techniques. Exposure to information that assists instructors create new course objectives or improve student success are always encouraged. The current curriculum is structured with consideration of the needs of our industrial partners and suggested content from the International Society of Automation. Faculty has attended and is encouraged to attend courses offered by the ISA or other professional organizations that are positioned to add to our knowledge of the 14 industrial clusters represented by our program content.

Memberships in electronic or engineering professional organizations are – considered by the faculty and suggestions are made for memberships related to maintaining the currency of the program.

An opportunity that was realized last summer was the full time faculty memeber working in an embeded position with PG&E for eight weeks. This allowed observation of techniques and work proceudres that confrimed or showed an area of improvement to the content being taught.

2. To guide future collaboration across student services, learning support centers, and instructional programs, describe the interactions that would help the program to improve student success.

Currently there are no tutors or instructional aides in the Learning Center that are prepared to assist the electronics students with assignments, computer programs and projects. This could potentially help students with problems outside of class or faculty office hours. Faculty is planning to meet with the Library and Learning Center staff to discuss developing these individuals. It could - improve student understanding and success rates and provide an informed knowledgeable resource.

The full time faculty is working with an ad hoc SotL committee to support and advance collaboration across disciplines such as mathematics, engineering and other sciences. The full time faculty is also working with the Reading Center to promote support for student assistance in reading and comperhension; learning tehniques that will help students that struggle with reading textbooks and other technical material. The full time faculty also serves on the academic senate which exposes the staff to what is going on at the school and what might impact the deptment. This involvement in school government gives insight into other student opportunities and services that can be passed on to the students.

3. To guide the **Institutional Planning Budget Committee** (IPBC) in long-range planning, identify any major changes in resource needs anticipated during the next three years. Examples: faculty retirements, equipment obsolescence, space allocation.

See the Resource Requests section below to enter itemized resource requests for next year.
Leave sections blank if no major changes are anticipated.

Faculty

Faculty: For the Electronics Program to stay current and informed of industry changes and updates our computers in the lab rooms will need to be updated and modified as the need arises with current and future software or hardware to allow our faculty and student body to stay compliant with industrial trends and procedures.

Equipment and Technology

Equipment and Technology: Currently the faculty is exploring designs for a workstation for hydraulics, pneumatics and vacuum experiments that will be included in ELEC 424 which is a course that will be offered for the A.S. Degree. Aslo the engineering dept. gave the electronics program two three axis robots the will be incorporated into motor control and communication courses once the devices are repaired.

Instructional Materials

Instructional Materials: Currently faculty is exploring the updating of the textbooks used in ELEC 111 and ELEC 112 as well as researching ebooks as a possible replacement to hold down student expenditures. Software packages are also being reviewed for possible use, but at this time there is not a defiant time table or priority driving this.

Classified Staff

Classified Staff: The department needs staff support in the form of an electronics technician. In the past the department had the use of a technician who was shared with the machine tool program. The Electronics Department has benefitted from multiple grants over the last five years that have added approximately $500,000 in new technology and equipment to the two primary labs. This equipment needs constant re-calibration and maintenance which the instructors are not able to execute. In addition we receive numerous shipments of supplies and consumable material that need to be inventoried and put away. The labs continuously need the stations worked on both for mechanical issues as well as cleanliness. (Due to the nature of the equipment the maintenance staff is not allowed to clean the stations.)

Facilities

No changes at this time

C. Program Plans and Actions to Improve Student Success

Prioritize the plans to be carried out next year to sustain and improve student success. Briefly describe each plan and how it supports the **Institutional Priorities, 2008-2013**. For each plan, list actions and measurable outcomes. (Plans may extend beyond a single year.)

Plan 1: Bridge to Power Pathways

This is a two week program that would help students bridge the gap between being prepared and not being prepared to start the Electrical Power Pathway Programs with proper math and reading comperhension skills.

Actions Needed:	**Completion Date:**	**Measureable outcome:**
Write a plan and organize curriculum	Spring 2014	Completion of plan and course outline.
Get approval from COI and dean	Fall 2014	Approval of Bridge to Pathways Bootcamp
Begin teaching Bridge to Pathways	Spring 2015	Student completion & enrollment in ELEC 111 and ELEC 231

5. Resource Requests

Itemized Resource Requests

List the resources needed for ongoing program operation.

Faculty

NOTE: To make a faculty position request, complete **Full-time Faculty Position Request Form, AY 2013-2014** and email to your Dean. This request is separate from the program review.

Full-time faculty requests	Number of positions
Provide 3 units of reassigned time to the one F/T faculty to handle program coordination, curriculum development and administrative responsibilities related to industry partnership development.	1

Equipment and Technology

Description	Cost
Kelvin HydraBasics Trainer (x6)	$1695.00 each
Pneumatics Basic Trainer (x6)	$1495.00 each
Fluke P5510 Pneumatic Pressure Tester (x2)	$2200.00 each
Fluke 91025 Dry Well Temperature Calibrators w/9930 Data Collection Software(x2)	$3300.00 each
Ashcroft 6 inch 0=300 PSIG Pressure Gauge (x2)	$400.00 each
Automation Direct GS-100 Variable Frequency Drive (x12)	$140.00 each
Automation Direct Programmable Logic Controller (x12)	$1000.00 each
B&B Electronics USPTL4-USB to RS-485 Data Comm Converter (x24)	$100.00 each

B&B Electronics USO9ML2-LS USB to RS-232 Data Comm Converter (x24)	$130.00 each
B&B Electronics USB type A male to type B standard USB cables (x24)	$130.00 each
Dell Computers w/Windows 8 (x26)	$1000.00 each
Dell Computer Laser Printer	$500.00 each

Instructional Material

Description	Cost

Classified Staff

Description	Cost

Facilities

For immediate or routine facilities requests, submit a CSM Facility Project Request Form.

Description	Cost

6. Program Maintenance

A. Course Outline Updates

Review the **course outline update record**. List the courses that will be updated in the next academic year. For each course that will be updated, provide a faculty contact and the planned submission month. See the **Committee on Instruction website** for **course submission instructions**. Contact your division's **COI representatives** if you have questions about submission deadlines.

Career and Technical Education courses must be updated every two years.

Courses to be updated	Faculty contact	Submission month

B. Website Review

Review the program's website(s) annually and update as needed.

Faculty contact(s)	Date of next review/update
Steven L. Gonzales	Spring 2014

C. SLO Assessment Contacts

Faculty contact(s)	Date of next review/update
Steven L. Gonzales	Fall 2014