

College of San Mateo

2018-19 CTE Instructional Program Review

First name Steven Last name Gonzales Email gonzales@smccd.edu

Program Name

Please select your program

Electronics Technology

Division

Please select your division

Business/Technology

Submission Date

1a. Provide a brief description of the program and how it supports the college's Mission and Values Statements, its Diversity Statement, CSM's and SMCCCD's Strategic Plans, and the college's Educational Master Plan. You may also discuss any factors that have impacted the program and its enrollment. Include changes in student populations, statewide initiatives, transfer requirements, advisory committee recommendations, legal mandates, workforce development and employment opportunities, and community needs.

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

The Electronics Technology Program is connected directly to the College San Mateo Mission by following the mandate to having open access to class offerings and current programs. The open access of courses is available to all students and community members. The only requirement is the individual meets any prerequisite needed to ensure success and a foundation to build on to best utilize the information and content presented in the program. The courses are academically comprehensive and industry compliant with the ability to develop the necessary skills and content 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's goal is to work closely with the current and future industrial partners to improve and update curriculum to be up-to-date and timely information needed to make our graduates attractive to hiring industries in the region. The curriculum that is presented to the students is crafted to span 14 different industrial clusters allowing completers to pursue employment in various faucets of the industrial electronics job market.

Our faculty promotes and reinforces the an academically rigorous, SLO 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 uses varying teaching techniques such as; E-learning computer programs, videos and on-line materials. The faculty has worked with the library to obtain materials that are content appropriate in other languages to support our diverse population. Instructors also make their power points and notes available to help students concentrate on lecture information and allow review, reinforcement and retention of presented information and content.

2a. Describe the results of your previous Program Review's action plan.

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

Since the last Program Review the Electronics Technology Program faculty has continued to review and update materials and content in all of the courses that make up the 19 unit certificate. This consists of researching and reviewing current industrial trends and pertinent on-line content that can affect a change in course curriculum that keeps the course offerings current and maintain industrial standards and procedures. The Associate Degree and the advance 16 unit certificate has been in the college catalog since 2016, but not supported by the courses being offered – this has been tied to low enrollment, scheduling and timing. We have not had the resources or facilities to begin offering the new classes – the faculty and dean have addressed this and the new courses will be offered in the coming program review cycle. At this time with the help of the program's instructional assistant we are readying lab 19-36 for teaching the Elec 424 and Elec 445 courses. There will also be some facilities work that needs to be completed before we can offer the courses. This work has been included in this program review and discussed by the faculty and the dean. A modification of how we schedule classes will also take place to allow the department to utilize the current hours of the week that are available. This modification will be lecturing three days a week then supporting the lecture material with an open lab that will be supported by the instructors and the instructional assistant. During construction and scheduling the final testing and development of content and labs will be completed to begin the new course offerings. In the 2016 Program Review the faculty standardized materials and content in the core courses (Elec 111, 112, 231, 232, and 405). This was completed, but at the end spring 2018 it was realized that a reassessment of lab books and content needed to be revamped to remove items that impeded the labs content to not flow properly.

2b. Program coherence and effectiveness: Explain any curriculum changes since last program review, including SLO alignments.

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

Since the 2016-2017 program review, we have banked Elec 144 which was very outdated and did not support the current solar industry needs or content. An alternate energy course will be written and developed to the course listings at a future date. Currently a general education course is in the process of being written and developed for the program. The purpose is to outreach to the general population of students and try to attract them to the current program.

Curriculum review is a semester to semester task and ongoing process. This is because the industrial electronics industry ebbs and flows with small changes in the application of technologies, instrumentation and process. This might lead to a subtle change in a lecture presentation and not a complete rewrite or update of a SLO or a course outline objective. Discussions between instructors and/or instructional assistants are incredibly important and can lead to a better way to present a topic or advance an idea without making major changes to the way a course is taught or the objectives met.

2c. Student success and equity: Discuss what your program has done to address equity gaps between student populations and between modes of delivery (online, hybrid, and face-to-face), describing your successes, works in progress, and/or ongoing challenges.

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

Equity is a new focus of interest in our program and has not been an issue as of this date. We have not had a student engage the facility about the topic as yet. Our program is extremely diverse (38% Hispanic, 24% White, 14% Asian, 9% Filipino, 5% Black.) and has had an outstanding award winning success rate for underserved populations. Our Hispanic students are performing above the college's average of 64% with a 65.8% percent of success, our Asian students are at 82.2% vs. 79% college average, our Filipino students performed under the college average of 70.9 with a 66.7% and our Black students at 70.6 % outperformed the college average by 3.7 %. Retention was 83% and 3.3% below the college average. This loss of students could be explained by the robust economy where everyone is employed. We pride ourselves on equal treatment and presentation of content. We will have to ask some questions of our current Filipino students to see if there is something we can change or offer to aid in their success.

2d. Provide an update on any long-term plans that are still in progress (if applicable).

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

We are still investigating the possibility of a bootcamp to help all students to increase success in the program. This would be offered in summer and winter prior to the start of a semester focusing on math, reading and study skills

3a. Course and program assessment. Discuss the results of your program assessment. Explain any strategies, research, initiatives, curriculum development or other activities intended to improve student learning and promote educational equity in your discipline, either at the course or program level.

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

1. Curriculum review of 19 unit certificate courses: Faculty reviewed the SLOs in the core and advance courses for value to industrial procedures, practices and needed knowledge to perform competently on the job. No changes were made to any content or theory, but updates on how the content would be presented and what components would be the focus in lab experiments were examined to give students as many real world scenario as possible.
2. Student learning review: Faculty assessed handouts, assignments, projects and labs to confirm their alignment to the necessary information for employment. Student's grades and learning outcomes were used to substantiate the success of content and materials.
3. Curriculum and content has been verified by our graduate's success in the job market and their continued marketability and demand. Feedback from alumni has also confirmed how accurate the curriculum is in their job tasks and duties. Faculty also confers with industrial partners to identify the skill and knowledge requirements of the profession.
4. Results: Faculty recommends to students courses that would be beneficial to their schedule. These additions are courses outside of our program to give our completers a solid grasp of how things work and will enhance their marketability and general knowledge base. Courses that are suggested: a basic physics course, basic Chemistry and classes in programming or coding. Soft skills like word and excel would also be helpful for future employment.

3b. General Education / Institutional assessment. Discuss participation in any General Education, Core Competencies, institutional or interdisciplinary assessment activities.

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

Our program does not currently support any GE SLO's – the addition of the aforementioned course in section 2b will change that for the next Program Review cycle.

4a. Review the program's available labor market data, as applicable. Here are two relevant links:

- [State of California Employment Development Department, Labor Market Information Division \(the official source for California Labor Market Information\):](#)
- [Employment data \(by Program Top Code\) from the State Chancellor's Office](#)

Explain how the program meets a documented labor market demand.

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

The Electrical Power Pathways Program is the only electro-mechanical program in the Northern California Region. Our program's goal and objectives are to educate entry or apprentice level technicians' for the Industrial Electronics Industry. This learned skill set is applicable to 14 industrial clusters in the state, nation and globally. Our graduates perform in the highest percentile when taking employment tests with scores above a 70% passing rate. The completers have excelled on both PG&E and Bay Area Rapid Transits employment exams. In 2015, one of our graduates passed the PG&E exam with a perfect 100% which had never been done before. As of May 2018 the Northern California Technologies Region (Alameda County, Santa Clara County, San Francisco Area, San Mateo County, and Santa Cruz County) has a 1.9% unemployment rate. Currently there are not enough technicians to fill all the jobs being posted on a weekly basis. The electro-mechanical technicians are not listed as a separate career, but have titles like calibration or maintenance tech – There are 38 job sectors in this region which our completers find employment; it showed that there was 13,800 jobs in 2016 and a projected increase of over 500 jobs in the next annual cycle. In the industrial cluster(s) requiring electro-mechanical technicians there was a significant increase of 4% which is slower than the national average in the San Mateo and San Francisco region.

4b. Summarize student outcomes in terms of degrees and certificates. Identify areas of accomplishments and areas of concern.

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

Presently the Electronics Program has not issued an Associates of Science Degree or an Advance Content Certificate (16 units) in Industrial Electronics, this is due to the department not offering the Advance content courses needed to complete the Associates of Science Degree or receive the Advance Certificate. This has been due to scheduling and low enrollment. The courses have been developed and need to be tested for proper instructional content. The department has identified specific equipment and purchased it. A request to build and modification of the facilities in lab 19-36. Has been addressed in the program review resource request. This is the only obstacle to teaching the advance courses. Spring 2019 is the kick off of Elec 422 and Elec 424 and lead to adding the courses to the schedule for the future. Our 19 unit certificate is still popular with students looking for a high paying good benefits careers and we have an average of 30 completers a year entering the job market. At this time we have not had a student return and inform us that they could not find employment or that they were lack skills that kept them from being hired.

4c. Review and update the program's Advisory Committee information. Provide the date of most recent advisory committee meeting.

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

The Electronics Technology Advisory Committee meeting of 10/5/2018 was convened to discuss reformation of an industrial partner dense group versus an Electronics Technology Faculty only group. Action items were handed out to be completed in the next year. These were the current action items that will be address in the next year:

- The dean addressed the cancelling Electronics 405 for spring 2019 due to under enrollment. Discussion about how to increase enrollment so this does not happen again.
- An introduction of faculty to Tiffany Zammit, CSM's Director for Dual Enrollment. This way faculty and the Director can work together to reach high school students who may be interested in CSM's Electronics program.
- The staff was tasked to see about buying more conveyors to have a class set. This would be purchasing 9 more conveyors.
- Faculty will work with Program Services Coordinator on ordering the additional conveyors your program needs. The Coordinator attended Banner training session where she was informed to pay for items via a requisition form and will assist the faculty to purchase needed equipment and devices.
- Faculty will assist the Director for Workforce Development and look at how to outreach to Job Train as a way to recruit new students.
- The clean-up project of 19-36 was discussed and who should contact Bob Domenici to pick up surplus items.
- The full time faculty is working on new curricular to attract general population students to the program. This will be in the form of a course that allows student to experience a survey of the Electronics of the 21st Century and where that can lead to a high paying good benefits career.
- The dean will reach out to the Counseling department to see when the Electronics program can visit a meeting to provide more information about courses and certificates.
- The full time faculty will submit a program review request for a uni-strut wall for in19-36.

5a. Provide a brief description, including actions, measurable outcomes, and timelines

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

During the 2016-2017 school year the faculty's continuous review, update of materials and content in all of the courses that make up the 19 unit certificate was completed. From that analysis, two improvements to the program has been suggested; Increasing Elec 232 to a two hour course and modifying content to align better with Elec 112 course. This update of the program and unit increase will be done by fall 2019. Elec 405 is being reviewed by the faculty and possibly being turned into a normal semester long course with amendments to content to enhance the material taught. The Advance certificate and the Associate Degree courses have not been offered as of spring 2019 and the content and materials for those courses have been finalized to begin teaching the courses in the fall of 2019. Currently testing of lab experiments and projects beginning done during fall 2018 and spring 2019 to ensure that the labs work and all necessary parts and components are ready for instruction. Review of the standardization of materials and content in the core courses is continuing between instructors who teach the same courses. This is accomplished by sharing lecture notes (power point presentations), worksheets, quizzes, tests, and projects so each student is receiving the same information throughout the program and helping them accumulate a solid technical foundation. The ELEC 111 & ELEC 112 lab books are reviewed each semester and currently are being updated to reflect the needs of the industry and ensure that the lab flows properly and incorporates topics learned in lectures.

5b. What will your program do to increase student success and promote student equity in the next two years? What kind of professional development and institutional support will be engaged and enacted to meet these goals?

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

The Electronics Program's concept for the next two years is to continue to support the mission and priorities 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. 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. The faculty is involved in any college programs focused on student success and equity a member of on campus committee and groups.

5c. Describe other professional development activities and institutional support and collaborations that would most effectively ensure that the program achieve its goals and plans.

If your answer is more than 2000 characters (approximately 300 words), please upload a Word document below (10 MB or less). If you're not sure, please upload your answer. Please upload text only; we cannot ensure that non-text such as images, diagrams, or charts will be retained in the final submission.

The faculty is and will continue to be involved in industry offered courses, training and conferences that can bring insight to the current program. Personal research and exploration of program content is on-going and will be shared to all staff to continue standardization of materials and content. The faculty will continue membership in professional organizations such as the BACCC, ISA and Bayworks. Faculty is also reviewing the possibility of writing a mathbook for the specific needs of their current program and future expansion of content in the two hour Elec 232.