Kaua`i Community College
Five Year Comprehensive Program Review (CPR)

Program Name: Electronics Technology

Assessment Period: (e.g., 2016-2021) 2013-2018

Program or Unit Mission Statement (UHCCP 5.202)

> **The Electronics Technology Program Mission Statement**: The Program's mission is to produce graduates who are technically competent, can communicate and work with others effectively, demonstrate responsible citizenship, leadership and an awareness of the global context of their work.

College Mission Statement (UHCCP 5.202)

> Kauaʻi Community College is a kahua that inspires, engages, and empowers learners and educators to enrich our community and our world.
>
> Ke kū nei ke Kulanui Kaiāulu ma Kauaʻi ma ke ʻano he kahua e
> hoʻoulu, hoʻā, a hoʻoikaika ʻia ai ka ʻike a me ka naʻauao o nā
> kānaka aʻo aku a aʻo mai no ka hoʻowaiwai ʻana i ke kaiāulu a
> me ka honua.
>
> ʻO ke kahua ma mua, ma hope ke kūkulu.
> First comes the foundation, then comes the building.
> (ʻŌlelo Noʻeau, number 2459)
>
> Kauaʻi Community College fulfills its mission by incorporating the following practices. The College:
>
> - Provides open access, affordable education;
> - Offers Certificates of Competence, Achievement, and Academic Subjects; Associate in Applied Science, Science, and Arts Degrees;
> - Welcomes and values diversity;
> - Delivers educational opportunities on campus in small classes, in the community, internationally, and through distance learning;
> - Provides programs that address workforce and community needs;
> - Prepares and supports students individually and collectively to succeed in academic endeavors and engage in life-long learning;

- Encourages innovation and promotes sustainability while perpetuating the unique history and culture of Kauaʻi.

Part I. Executive Summary of Program Status

There were no recommendations communicated after last CPR or APRU.

Part II. Program Description (UHCCP 5.202)

Brief History of Program	The Electronics Technology program at Kauaʻi Community College was created to meet the demand for technicians on the island of Kauaʻi. The curriculum offers basic electronics, computer maintenance, programming and networking technologies (IT, Information Technology) courses enabling graduates to qualify for entry-level technician or IT positions. Elective courses in advanced networking are offered through the embedded Cisco Networking Academy Program. Courses in fiber optics, RF, and photonics are also offered on an irregular schedule. Students leaving the program or completing and exiting by means of the COC (Certificate of Competence), CC (Certificate of Completion), CA (Certificate of Achievement), and/or the AS (Associates in Science) degree fulfill basic competencies enabling entry into the variety of jobs requiring knowledge of advanced technology.
	AS degree graduates may seek electronics technician positions or may choose to continue their education at baccalaureate electronics or computer engineering technology programs. University of Hawaii Maui College offers a BET (Bachelors in Engineering Technology) and the program has articulated many of its courses with this program.
	Students planning on pursuing Bachelor's degrees in engineering or computer science are enrolled in the ASNS program at Kauaʻi Community College, and the first circuits and programming classes for engineers are taught by the electronics faculty as of 2014. The demand for graduates with a four year degree is growing due to ever advancing technologies. Students presently need to relocate to another island in order to pursue a four year degree, which continues to create a hardship for many.
Number of Faculty and Staff	Faculty (FT): 2 Faculty (Lecturers): 1 Staff: 3 (grant funded)
Date Website Last Reviewed/Updated	Fall 2018
For Instructional Programs ONLY	

Graduate Occupation or Transfer Options	electronics technician, IT technician, transfer to BSET 4 year degree
Special Admission Requirements	none
Credentials Offered	AS Electronics Technology CO Programming CO Network Security CO Computer Support CA Electronics Technology CA Network Administration and Security Cisco I Cisco II
Current Program Articulation Agreements (Institution and Expiration Date)	Institution: Expiration Date: Institution: Expiration Date:
Distance Education Courses Offered	EE 211, EE 213, EE 160 (taught by the faculty in the Electronics Technology department, since the faculty are engineers)
Early College Courses offered (total number of sections/high school)	Course Alpha and Number – # sections – High School none
Distance Education Programs offered	None
Current Advisory Board Members/Employer and last meeting date	Member Name Employer Manu Kai, PMRF, Lockheed Martin, Solaris, various military subcontractors Last Meeting Date: F 2018
Employer Internships	none currently
For Non-Instructional Programs ONLY	
Community Partnerships, Advisory Committees, etc.	

Part III. Analysis of Quantitative Indicators

The Overall Program Health is Unhealthy.

DEMAND

The Electronic Technology program's strength and weakness are analyzed in terms of demand, efficiency, and effectiveness. The Demand analysis is performed with respect to the single permitted CIP code of 15.0303, but this is overly restrictive and not representative of all employment opportunities for graduates. To improve the analysis, the program suggests including additional relevant job codes from the Hawaii Industry Sectors website, http://uhcc.hawaii.edu/workforce/index.php, in the form of SOC codes (Standard Occupational Classification), for graduates of this program as shown in Table 1. If more job codes were included, the number of available jobs would be greater improving the Demand Indicator. For example, in 2009-2019 sixteen SOC codes were used, and the program was consider healthy with twelve available jobs.

Table 1. Electronics Technology relevant SOC codes.

SOC Code	Occupations in this Cluster	Education Level
17-3023	x STEM Occupation Electrical and Electronics Engineering Technicians	Associate's degree
49-2094	x Electrical and Electronics Repairers, Commercial and Industrial Equipment	Postsecondary nondegree award
15-1151	x STEM Occupation Computer User Support Specialists	Some college, no degree
17-3024	x STEM Occupation Electro-Mechanical Technicians	Associate's degree
49-2022	x Telecommunications Equipment Installers and Repairers, Except Line Installers	Postsecondary nondegree award
15-1152	x STEM Occupation Computer Network Support Specialists	Associate's degree

Demand indicators provided by the UH system with one CIP code state 1 (one) county prorated job is available. But, by remaining in contact with graduates and local employers, the program is able to report that four students in the past year have been placed and faculty received multiple calls, emails and visits to fill more positions. The formula for the Demand Indicator is "New & Replacement County Positions divided by Graduates." With 4 placements and 3 graduates the program health would be 4/3 =1.33 minimum ("Cautionary"), but there were actually more positions available (according to the employers) but the program did not have graduates available! The Demand Indicators have been unhealthy for 8 years since the use of one CIP code was initiated. The 5-year history is shown below:

	Demand Indicators	Program Year					Demand Health
		13-14	14-15	15-16	16-17	17-18	
1	New & Replacement Positions (State)	13	13	70	70	68	
*2.	New & Replacement Positions (County Prorated)	0	1	1	1	1	
3	Number of Majors	45	44	44	32	20	
3a.	Number of Majors Native Hawaiian	12	13	10	9	4	Unhealthy
3b.	Fall Full-Time	49%	43%	33%	53%	27%	
3c.	Fall Part-Time	51%	57%	67%	47%	73%	
3d.	Fall Part-Time who are Full-Time in System	4%	4%	0%	0%	0%	
3e.	Spring Full-Time	40%	33%	31%	45%	33%	
3f.	Spring Part-Time	60%	67%	69%	55%	67%	
3g.	Spring Part-Time who are Full-Time in System	13%	2%	5%	3%	0%	
4	SSH Program Majors in Program Classes	455	401	248	263	159	
5	SSH Non-Majors in Program Classes	352	383	85	120	67	
6	SSH in All Program Classes	807	784	333	383	226	
7	FTE Enrollment in Program Classes	27	26	11	13	8	
8	Total Number of Classes Taught	23	21	12	14	12	

EFFICIENCY

The efficiency indicator was healthy last year, when the quantitative indicators showed the correct two faculty. This year it is erroneously showing only one faculty. However, the average class size is also down somewhat. The five year history is below:

Efficiency Indicators				Program Year			Efficiency Health
		13-14	14-15	15-16	16-17	17-18	
9	Average Class Size	11.8	12.3	10	10	8	
*10.	Fill Rate	73.60%	74%	68.90%	66.70%	50.00%	
11	FTE BOR Appointed Faculty	2	2	2	2	2	Cautionary
*12.	Majors to FTE BOR Appointed Faculty	22.2	22	22	16	10	
13	Majors to Analytic FTE Faculty	18.2	19.5	44	16	20	
13a.	Analytic FTE Faculty	2.4	2.3	1	2	1	
14	Overall Program Budget Allocation	$172,149	$400,191	$154,332	$178,866		
14a.	General Funded Budget Allocation	$162,663	$123,056	$149,826	$174,907		
14b.	Special/Federal Budget Allocation	$0	$273,286	$0	$0		
14c.	Tuition and Fees	$9,486	$3,849	$4,506	$3,959		
15	Cost per SSH	$213	$510	$463	$467		
16	Number of Low-Enrolled (<10) Classes	6	4	5	5	9	

EFFECTIVENESS

Effectiveness is cautionary, even though successful completion and persistence is improved. This is likely due to less graduates last year. A few students were short a class or two and will be graduating this year instead. The program expects Effectiveness to return to its usually Healthy rating next year. Fill rate is also lower this year.

Effectiveness Indicators				Program Year			Effectiveness Health	
		13-14	14-15	15-16	16-17	17-18		
17	Successful Completion (Equivalent C or Higher)	86%	83%	77%	77%	86%	Cautionary	
18	Withdrawals (Grade = W)	8	14	9	8	1		
*19.	Persistence Fall to Spring	65.30%	69.50%	65%	66%	67%		
19a.	Persistence Fall to Fall	38.70%	47.70%	34%	46%	45%		
*20.	Unduplicated Degrees/Certificates Awarded	19	24	12	15	10		
20a.	Degrees Awarded	6	4	2	5	2		
20b.	Certificates of Achievement Awarded	1	1	5	6	1		
20c.	Advanced Professional Certificates Awarded	0	0	0	0	0		
20d.	Other Certificates Awarded	21	37	17	28	12		
21	External Licensing Exams Passed	Not Repor	Not Reported					
22	Transfers to UH 4-yr	2	1	0	1	1		
22a.	Transfers with credential from program	0	0	0	1	0		
22b.	Transfers without credential from program	2	1	0	0	1		

PERKINS indicators

Perkins Indicators						Goal (17-2018)	Actual	Met
29	1P1 Technical Skills Attainment	100	100	90	100	92.92	100	Met
30	2P1 Completion	57.14	75	50	50	51.51	50	Not Met
31	3P1 Student Retention or Transfer	80	91.67	81.82	62.5	81.81	83.33	Met
32	4P1 Student Placement	71.43	57.14	75	60	64.51	50	Not Met
33	5P1 Nontraditional Participation	13.51	10.81	9.76	16.13	23	17.86	Not Met
34	5P2 Nontraditional Completion	6.67	0	11.76	33.33	22.22	18.18	Not Met

Technical Skills Attainment and Student Retention/Transfer are MET, and Completion is within a fraction of a student of being MET. Nontraditional Participation and Completion are higher than the national averages of 17.1% and the Hawaii average 16%. http://uhcc.hawaii.edu/workforce/groups/sector_allocation.php?dts=2016&dte=2026&se=0&g=17-3023. The goal of 23% given to the program may be unrealistic and not reflective of state and national data.

Overall, the Electronics Technology Program enrollment is down, and demand for its graduates is not being met. The official quantitative indicators inaccurately portray the actual demand for the program graduates. The program needs to improve its enrollment, perhaps by early college activities, however with only two faculty that would be difficult. The program is strong technically, and per advisory meetings, is properly training students for jobs in electronics. Employers would additionally like more IT or Cyber training, but more faculty would be required.

Part IV. Assessment Data (EP 5.202)

PSLO	Date Last Assessed	Findings	Improvements Implemented	Next Assessment Date
Demonstrate an appropriate mastery of the knowledge, techniques, and skills in the use of contemporary tools of electronics technology.	2018	This is a cumulative PSLO evaluated over many courses, This PSLO is met by students achieving better than 70 % in chosen CLSOs in ETRO 101, 105,106, 143,143L, 280, 187, 240 B, 240C, 161 and ICS 111.Assessment shows this PSLO is met.		Evaluated continuously
Demonstrate theoretical and technical knowledge of components, systems, and control processes that govern the outcomes of systems for purposes of operation, maintenance, and improvement.	2018	This is a cumulative PSLO evaluated over many courses, This PSLO is met by students achieving better than 70 % in chosen CLSOs in ETRO 101, 105,106, 143,143L, 280, 187, 240 B, 240C, 161 and ICS 111.Assessment shows this PSLO is met.		Evaluated continuously
Apply current technical knowledge in the analysis and solution of technical problems.	2018	This is a cumulative PSLO evaluated over many courses, This PSLO is met by students achieving better than 70 % in chosen CLSOs in ETRO 101, 105,106, 143,143L, 280, 187, 240 B, 240C, 161 and ICS 111.Assessment		Evaluated continuously

		shows this PSLO is met.		
Function effectively on teams interacting with all levels of personnel, fully participating, and adding to the dynamics of the group.	Continuous: assessed in part each semester.	This is a cumulative PSLO evaluated over many courses	Difficult to assess. Instructor observation in many classes shows it is being met.	Evaluated continuously
Communicate effectively orally, in writing, and by means of the various electronic communication devices.	2018. Assessed mainly in ETRO 101	Skills should be incorporated in more ETRO classes		2019
Exhibit professional, ethical, and social responsibilities showing a respect for diversity and an awareness of contemporary professional, societal, and global issues.	2018	This PSLO is highly subjective and not quantifiable	Plans to remove it	2023
Explain the importance of commitment to quality, timeliness, and continuous professional improvement in adapting to emerging technologies.	2018	This is a cumulative behavioral and not quantifiable PSLO. Yes, this college grows people, so it is a good PSLO, but not measureable.	Unfortunately plans to remove it	2023

Electronics Technology involves a sequence of many courses, each of which contribute to PSLOs. Most of the courses are on a 2 year cycle. The program prefers to assess at the course level, where CSLOs are aligned to industry standards, and then provide a mapping to the PSLOs since multiple courses contribute cumulatively to a particular PSLO. This map has been developed and applied to the findings above.

Learning outcomes should be modeled after the competencies recommended by the Electronics Technician Association International (ETA-I), which they are on our course level. Competencies listed by ETA-i.org are extensive and highly technical. Condensed and somewhat vague versions have been created for PSLOs, consistent with campus guidelines.

This campus has been visited by multiple high tech local companies this year. The industry is seeking technicians from this campus (local graduates). The industry representatives have reviewed our program and additionally validated the content which is aligned to ETA-i.

Part V. Curriculum Revision and Review

Course Prefix and Number	Date Last Reviewed	Next Review Date
ETRO 101	2017/18	2022/23
ETRO 105	2013/14	2018/19
ETRO 106	2017/18	2022/23
ETRO 140B	2013/14	2018/19
ETRO 143	2018/19	2023/24
ETRO 143L	2018/19	2023/24
ETRO 161	2013/14	2018/19
ETRO 166	2018/19	2023/24
ETRO 18	2013/14	2018/19
ETRO 187	2013/14	2018/19
ETRO 199V	2013/14	2018/19
ETRO 210	2017/18	2022/23
ETRO 240B	2013/14	2018/19
ETRO 240C	2013/14	2018/19
ETRO 244	2013/14	2018/19
ETRO 245	2013/14	2018/19
ETRO 247	2018/19	2023/24
ETRO 248	2013/14	2018/19
ETRO 257	2018/19	2023/24
ETRO 275	2013/14	2018/19
ETRO 280	2018/19	2023/24
ETRO 287L	2013/14	2018/19
ETRO 299V	unknown	2018/19
ICS 111	2017/18	2022/23

Part VI. Survey Results

List results of surveys administered during the review timeframe

Survey Type	Date Administered	Date of Next Survey	Results
none for this program			

Part VII. Financials

Provide your program or unit's budget for each year of this review.

Fiscal Year	Budget
2018/19	**$2500/semester**

Provide the program or unit's current resources.

Category	What is needed?	Justification
PERSONNEL		
Positions (Faculty) Georgeanne Purvinis, PhD Robert Swanson, PhD		
Positions (Staff) Nicholas Herrmann Tom Ellis John Kirby (staff is grant funded)	technician, 1 FTE	Program has very high equipment maintenance needs. (approx 25 oscilloscopes, 40 power supplies, 20 function generators, 25 computers, 20 computers disassembled, 30 multimeters, routers, switches, CNC PCB mill, lasers, laser cutter, 3D printers, power tools, 10 spectrum analyzers, hand tools, chemical and other electronic consumables) *Currently our technicians are grant funded but this is the last year*. The equipment and consumables maintained by the program is also used by SAM classes for engineering.
OPERATING		
Supplies	$2500/semester minimum	Three classes have upwards of $200/semester/student in consumables. Other classes also have consumables, but less. (solder, flux, IPA, electronics parts, ABS, teflon, acrylic, wire, shrink tube, circuit boards, blank circuit boards, etching chemicals, connectors, ICs, cables, connectors, batteries, passive and active components, etc.)

Equipment - extensive		
Space/Facilities- adequate		
TECHNOLOGY		
Hardware approx 25 oscilloscopes, 40 power supplies, 20 function generators, 25 computers, 20 computers disassembled, 30 multimeters, routers, switches, CNC PCB mill, lasers, laser cutter, 3D printers ,power tools, 10 spectrum analyzers, hand tools, chemical and other electronic consumables	24 high end computers or new SSDs (solid state drives) to speed computation	Enhances 6 year old computers that are lagging due to the computationally intense software used by the program
Software		

Part VIII. Results of Prior Year Action Plans (UHCCP 5.202)

Action Plan (2013 CPR)	Anticipated Outcome	Actual Outcome
ETRO1 -Pursue grant to provide remote hands-on lab capability anytime, from anywhere	increased distance access	C3T3 Grant awarded
ETRO 2 -Improve non-traditional participation	Grant funding to support activities	Not awarded
ETRO 3 - Develop curriculum and expertise to support rapidly changing and evolving new technologies; particularly to support increased job placement into engineering or computer specialist positions		ASNS-engineering developed and courses offered
ETRO 4 - Provide a technically up-to-date hands-on learning environment and opportunities for students to obtain industry recognized certifications.		Through multiple grants, entire program's lab and classroom space has been renovated and upgraded. A Pearson Testing center is now operating on campus
ETRO 5 - Seek out and fund professional development opportunities to keep pace with rapidly changing technologies.		PCATT attendance funded
ETRO 6 - Collaborate with the Hawaii Space Flight lab, local high tech business, and PMRF to support high tech job opportunities and enrichment for the students.		Though grants students have participated and flown science payloads on 3 NASA rockets

ETRO 7 - Support k-12 science activities, such as Kaua`i InStep, Science Fair, and Science Olympiad.	Participate annually in these activities	Annual participation continues./ Kauai InStep no longer funded.
ETRO 8 - Ensure safe and modern sustainable practices are incorporated into the ETRO program		Surface Mount Technology incorporated into curriculum. Circuit board milling machine purchased with grant funds.
ETRO 9 - Engage with KauCC's sister colleges in Japan to foster international collaborations and understandings.		Purvinis and Kyoko Ikeda developed relationships. Japanese students participate in ETRO classes annually
ETRO 10 – Leverage global presence of the Cisco Networking Academy program to foster collaboration with other colleges.	Actively engage students and instructors in Cisco Networking Academy functions such as the Global NetRiders competition, and collaborate with other academies. Also use to encourage High School participation.	Lead instructor retired

Part IX. Analysis of Program

Goal	Strategic Goal/Priority (List number)*	Benchmark	Desired Outcome	Unit of Measure	Year(s) Implemented
Offer CompTIA security and Network classes (not CISCO vendor specific)	Goal 9 Increase STEM workforce Metric: increase the number of annual STEM degrees from 13 to 20 by 2021	COs appropriately modified	Increase enrollment from high tech employers currently sending staff to Oahu	students	2020 and later
Grow on-line engineering courses	Goal 4 Increase the number of students who transfer Goal 12 Strengthen distance education offerings Goal 9 Increase STEM workforce Metric: increase the number of	enrollment of 8 or more consistently in EE 211, EE213, EE160	enrollment of 8 or more consistently in EE 211, EE213, EE160	students	2020 and later

	annual STEM degrees from 13 to 20 by 2021				
Maintain program assets: Insures approx 25 oscilloscopes, 40 power supplies, 20 function generators, 25 computers, 20 computers disassembled, 30 multimeters, routers, switches, CNC PCB mill, lasers, laser cutter, 3D printers ,power tools, 10 spectrum analyzers, hand tools, chemical and other electronic consumables will not fall into disrepair and disorganization	Goal 13 Enhance facilities with appropriate technology and ensure facilities support 21st century learning and teaching environment	position approved	hire permanent staff technician	staff position	F2019 and all subsequent years

*All Strategic Goals and Priorities are Aligned to the College Mission.

Part X. Resource Request(s) for next year (Year 1 of the 5-year Plan for your unit or program).

Program Goal	Maintain program assets
Resource Requested*	permanent electronic/mechanical technician
Cost and Vendor	
Annual Recurring Cost	$60,000
Useful Life of Resource	indefinite
Person(s) Responsible and Collaborators	G.Purvinis, R. Swanson, G. Talbo Note: technician may support all of trades
Timeline	Fall 2019

*An approved ITAC Request Form must be attached for all technology requests

Program Goal	Upgrade existing (grant funded) computers
Resource Requested*	24 SSDs 250 Gbyte min
Cost and Vendor	NewEgg SAMSUNG 850 EVO mSATA 250GB SATA III 3D NAND Internal SSD Single Unit Version MZ-M5E250BW $179.40 each (example)
Annual Recurring Cost	0
Useful Life of Resource	5-10 years
Person(s) Responsible and Collaborators	G.Purvinis, R. Swanson
Timeline	Fall 2019