HAWAIʻI COMMUNITY COLLEGE
PROGRAM ANNUAL REVIEW REPORT

Information Technology

April 5, 2017

Review Period
July 1, 2015 to June 30, 2016

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Program/Unit Review at Hawaiʻi Community College is a shared governance responsibility related to strategic planning and quality assurance. Annual and 3-year Comprehensive Reviews are important planning tools for the College's budget process. This ongoing systematic assessment process supports achievement of Program/Unit and Institutional Outcomes. Evaluated through a college-wide procedure, all completed Program/Unit Reviews are available to the College and community at large to enhance communication and public accountability. Please see http://hawaii.hawaii.edu/files/program-unit-review/

Please remember that this review should be written in a professional manner. Mahalo.

PROGRAM DESCRIPTION

Describe the Program	
Provide the short description as listed in the current catalog.	The Information Technology program is a career-laddered, competency-based program that provides training in the use and support of business-related computer systems, data communication networks (including local area networks), and the development of business computer information systems using procedural, event-driven and object-oriented programming techniques. The program includes a combination of business, computer, and information technology courses. Campus-based computer and networking projects, faculty supervised laboratories, and workplace internships provide hands-on experience designed to prepare students for positions in computer support, programming, network administration, and/or system development in a business information technology system. The program focuses on computers and information technology as tools to solve business problems.
Provide and discuss the program's mission (or goals and objectives if no program mission statement is available).	**Information Technology Program Outcomes:** 1. **Information Systems**: Plan, develop, and implement the hardware, software, and procedural components of a data processing system in a business environment. 2. **Networking**: Plan, develop, and implement the hardware, software, and procedural components of a data communications system in a business environment. 3. **Programming**: Plan, develop, implement, and document computer programs that meet the data processing requirements of a business organization. 4. **Productivity**: Work independently and cooperatively to deliver reports, programs, projects, and other deliverables that document a business organization's information technology requirements. 5. **Legal/Ethical/Professional**: Base decisions and

	actions on the legal, ethical, and professional guidelines and practices of the information technology field. 6. **Explore**: Demonstrate the ability to search, analyze, and synthesize current information and solutions in the rapidly changing information technology profession.

Comprehensive Review information: Required for ARPD Web Submission

Provide the year and URL for the location of this program's last Comprehensive Review on the HawCC Program/Unit Review website: http://hawaii.hawaii.edu/files/program-unit-review/	
Year	2015
URL	Information Technology - IT
Provide a short summary regarding the last Comprehensive Review for this program. Discuss any significant changes to the program since the last Comprehensive Review that are not discussed elsewhere in this review.	The IT Program has added a new cybersecurity Certificate of Competence (IT-ISA-CO) in Information Security and Assurance.

QUANTITATIVE INDICATORS

ARPD Data

Please attach a copy of the program's ARPD data tables and submit with the Program Review document.

a) **If you will be submitting the Program Review document in hard copy, print and staple a copy of the data tables to the submission; the icon to print the data tables is on the upper right side, just above the data tables.**

OR

b) **If you will be submitting the Program Review document in digital form, attach a PDF copy of the data tables along with the digital submission; the icon to download the data tables as a PDF is in the upper right side, just above the data tables.**

Program data can be found on the ARPD website: http://www.hawaii.edu/offices/cc/arpd/

ANALYSIS OF THE PROGRAM's DATA

Analyze the program's ARPD data for the review period. Describe, discuss, and provide context for the data, including the program's health scores in the following categories:	
Demand	The Demand was rated as "unhealthy" because of the use of a single occupational code in the analysis. Actually, IT graduates are hired in several job categories. The IT field in general is expanding, particularly with the growth of the cybersecurity sector, which aligns with our new cybersecurity certificate program.
Efficiency	The "Cautionary" rating of the IT program appears to be due to an average class size of slightly less than 12. This is due to the nature of the courses, which are constrained by the number of computers and hands-on nature of many of the classes.
Effectiveness	The IT program is rated as "healthy" in effectiveness due to the large number of graduates. The program has steadily worked on increasing effectiveness despite maintaining rigorous standards in classes. The program rigor has been important in keeping a high reputation for it in the community, which has made it easier for our graduates to find professional positions.
Overall Health	The overall health is listed as "cautionary" largely due to the artificially poor rating for demand, based on the use of a single job category in the analysis.

Distance Education	N/A
Perkins Core Indicators (if applicable)	The program is listed as not meeting five of the six Perkins Core indicators. It has an overly optimistic 1P1 technical skills attainment goal of 91%. The majority of IT students have met this indicator. The Program has just missed the 2P1 attainment goal of 50.3 %, with a completion score of 50 %. As last year, the program missed its 4P1 student placement goal, with some students opting to continue their education rather than going immediately into the job market. The program also fell just short of its goal for non-traditional participation, and those non-traditional students who are in the program have not yet completed their studies. Attainment of the program's action goals, particularly the hiring of a second full time faculty member for the program, will greatly increase the program's ability to meet the Perkins Core indicators.
Performance Funding Indicators (if applicable)	The program has steadily increased its number of graduates, while continuing to have students continuing their studies in 4-year programs at UH.
Describe any trends, and any internal and/or external factors that are relevant to understanding the program's data.	Presence of only one full time faculty member has made it difficult to expand on the already extensive recruitment efforts. The market for our graduates continues to be robust, but is not captured in the analysis that relies on a single job code.
Discuss other strengths and challenges of the program that are relevant to understanding the program's data.	The addition of the cybersecurity certificate and its associated curriculum gives additional opportunities to our students, but increases the challenge to the single faculty member to cover all areas of the program.

Analyze the program's IRO data for the year under review. See above.	
Describe, discuss, and provide context for the data.	N/A

Discuss changes made as a result of the IRO data.	N/A

Report and discuss all major/meaningful actions and activities that occurred in the program during the review period. For example:	
Changes to the program's curriculum due to course additions, deletions, modifications (CRC, Fast Track, GE-designations), and re-sequencing	The IT Program is part of the University of Hawaii-Hawaii Community Colleges consortium receiving a TAACCCT IV grant. Grant period is from October 2014 to September 2018. Under this grant, two new courses were developed and offered in the IT program. ICS 281 "Ethical Hacking" (3 credits) and ICS 282 "Computer Forensics" (3 credit) have been added to the curriculum. These two new courses allow students to obtain a Certificate of Completion in cybersecurity (CO). This CO consists of 23 credits. Students are able to enroll in these two courses after they have completed the 17 credits of prerequisites taken from the IT-AS program. ICS 281 "Ethical Hacking" was offered in fall 2016. ICS 282 "Computer Forensics" will be offered in spring 2017.
New certificates/degrees	The first cohort of our new cybersecurity CO (developed under the TAACCCT IV grant) will be graduating in fall 2017.
Personnel and position additions and/or losses.	None

Other major/meaningful activities, including responses to previous CERC feedback.	N/A CERC report has not been released yet.

Describe, analyze, and celebrate the program's successes and accomplishments. (For example*, more students were retained/graduated* OR *the program successfully integrated new strategies/technologies*.)	
Discuss what the program has been doing well. Are there areas that needs to be maintained and strengthened? Please provide evidence if applicable (ex: program data reports, relevant URL links, etc.).	The program has steadily increased the number of graduates, and it has been successful in having the graduates obtain professional positions or continue their education. Attached: February 2017 IT Program Advisory Committee Report Assessment report for ITS 108 and ITS 284

Describe, analyze, and discuss any challenges and/or obstacles the program has faced.

Identify and discuss the program's challenges/obstacles.	There is only one full time faculty member to support the program since fall 2009. The full time faculty member has to teach full time, create and update all curricula, and perform all advising for 39 majors. She also must write all program reports and assessments and carry out recruitment activities. The technology field is a very intensive field. Thus keeping our IT program current takes a tremendous amount of time for the one full time faculty member. This could lead to burn out for that individual, and at the least curtails her ability to recruit new students and provide as much time as she'd like to work individually with students outside of class. It is of the utmost importance that we create another full time IT position in the IT program, especially with the two new cybersecurity courses that we are offering to meet the current demand of training personnel for the cybersecurity workforce. Relying on lecturers teaching 15-18 credits per semester for the past seven years shows that there is a need for a second position. We have started to build an IT lab in Building 346 Room 139. This is a good start. Future funding to equip the lab will be requested. The IT program has evolved considerably from its origins as a data processing program. The program now is a full-fledged STEM field, and is now somewhat out of place in the Business Education Division. Consideration should be given to moving the program into the Math and Natural Sciences Division in the near future.
Discuss changes and actions taken to address those challenges, and any results of those actions.	The current IT full time faculty member has requested a second position for several years. She has requested a half-time position when the second Marketing/BEaT position was advertised two years ago but with no success. If the IT program is to move forward and be a more successful program of the college, extra help to the one full time faculty must be provided.

Discuss what still needs to be done in order to successfully meet and overcome these challenges.	1. Create a second full time IT faculty position. 2. Provide extra funding for the IT lab when requested.

PROGRAM ACTION PLAN

Discuss the program's prior year's (AY14-15) action plan and results.	
Describe the program's action plan from the prior review period and discuss how it was implemented in AY15-16.	1.Increase major count 2. Develop and implement curricula in cybersecurity 3. Develop new computer lab
Discuss the results of the action plan and the program's success in achieving its goals.	1. Despite a general decline in the number of majors for the college as a whole in past years, the IT Program, through its recruitment efforts, has maintained a fairly steady major count. 2. The Program has successfully created its new cybersecurity Certificate of Competence, including introducing two new courses in cybersecurity in the 2016-17 academic year. 3. The new computer lab is nearly complete, but still needs to be equipped.
Discuss any challenges the program had in implementing that action plan or achieving its goals.	The improving economy has led to many potential students moving directly into the job market instead of pursuing community college degrees, making recruitment more difficult. It has been difficult to find lecturers with the appropriate expertise to assist the single full time faculty member in offering courses beyond the introductory level, including those in the new cybersecurity area.

- Did the program review its website during AY15-16? Please check the box below that applies.

☒ Reviewed website, no changes needed.

☐ Reviewed website and submitted change request to webmaster on _____(date)_____.

☐ Reviewed website and will submit change request to webmaster.

Please note that requests for revisions to program websites must be submitted directly to the College's webmaster at
http://hawaii.hawaii.edu/web-developer

Discuss the program's overall action plan for AY16-17, based on analysis of the Program's data and the overall results of course assessments of student learning outcomes conducted during the AY15-16 review period.	**Benchmarks and Timelines for implementation and achievement of goals.**
Action Goal 1: Continue to increase major count and number of graduates.	**Benchmarks/Timelines:** Increase major count from 39 to 45 by spring 2017. Reduce the variability year-to-year in number of graduates; average 20 graduates per year in next three years.
How can this action Goal lead to improvements in student learning and attainment of the program's learning outcomes (PLOs)? By increasing the number of students, it will be possible to increase program offerings, allowing students more flexibility in attaining their academic goals. The expanded course offerings will enhance our ability to meet our PLOs, including: PLO 1, "Plan, develop and implement the hardware, software, and procedural components of a data processing system in a business environment"; PLO 2, "Plan, develop and implement the hardware, software, and procedural components of a data communication system in a business environment"; and PLO 3, "Plan, develop, implement, and document computer programs that meet the data processing requirements of a business organization."	
Action Goal 2: Obtain a second full time faculty member in the IT Program.	**Benchmarks/Timelines:** Hire the second faculty member during the 2017-18 academic year.
How can this action Goal lead to improvements in student learning and attainment of the program's learning outcomes (PLOs)? The second faculty member will allow expansion of the curriculum, and provide a second specialization among the faculty. This will enable expansion of program offerings, and will	

therefore enhance PLO 1, PLO 2 and PLO 3 as noted above.	
Action Goal 3: Do further planning on possible expansion of the cybersecurity program area.	**Benchmarks/Timelines:** Planning to commence Fall 2017, with possible new courses added beginning in Fall 2018.
How can this action Goal lead to improvements in student learning and attainment of the program's learning outcomes (PLOs)? Expansion of cybersecurity courses will allow students more opportunities to obtain positions in this expanding and diverse IT job market.	

RESOURCE IMPLICATIONS

NOTE: General budget asks are included in the 3-year Comprehensive Review. Budget asks for the following categories only may be included in the Annual review: health and safety needs, emergency needs, and/or necessary needs to become compliant with Federal/State laws/regulations.

Please provide a brief statement about any implications of or challenges with the program's current operating resources.

1. There is a need to equip the new computer lab.
2. While not specifically an issue of operating resources, consideration should be given to moving the IT Program into the Math and Natural Sciences Division, to align with the college's other STEM programs. The IT program has evolved considerably from its origins as a data processing program. The program now is a full-fledged STEM field, and is now somewhat out of place in the Business Education Division. Consideration should be given to moving the program into the Math and Natural Sciences Division in the near future.

Major benefits include: 1. Shared resources with other STEM programs. 2. Better student interaction among other STEM programs that might lead to increase in students transferring to baccalaureate degrees in the STEM field. 3. Ease of counseling. 4. Ease in synchronization in curriculum development among the STEM programs.

For budget asks in the allowed categories (see above):	
Describe the needed item(s) in detail.	To hire a second IT faculty.
Include estimated cost(s) and timeline(s) for procurement.	Hiring of a second IT faculty for approximately $60K annually. Ideally to start in fall 2018.
Explain how the item(s) aligns with one or more of the strategic initiatives of 2015-2021 Strategic Directions.	Addition of a second full time faculty member will allow improved recruitment and communication efforts at the high school level, helping to meet HGI Action Strategy 1: Strengthen the pipeline from K–12 to the university to improve college readiness and increase college attendance. Full implementation of the new cybersecurity certificate will help meet HGI Action Strategy 3: Anticipate and align curricula with community and workforce needs. Also, under HI2 Action Strategy 3, the new certificate will directly meet the goal to "Continue to support programs that suit Hawai'i Island's location and environment as well as address critical gaps" with cybersecurity one of the areas highlighted. Included in the tactics for meeting HI2 Action Strategy 3 is: "Work closely with employers to increase the qualified and skilled workforce base," which is a particular strength of the IT program through its intern ship coursed and community Advisory Committee. The IT program's action plan to increase the number of graduates meets the Action Strategy's goal of increasing the number of STEM graduates as listed under "Productivity and Efficiency Measures for Hawai'i Innovation Initiative (HI2)."

http://hawaii.hawaii.edu/sites/default/files/docs/strategic-plan/hawcc-strategic-directions-2015-2021.pdf

LEARNING OUTCOMES ASSESSMENT

For all parts of this section, please provide information based on CLO (course learning outcomes) assessments conducted in AY 2015-16, and information on the aligned (PLOs) program learning outcomes assessed through those course assessments.

If applicable, please also include information about any PLO assessment projects voluntarily conducted by the program's faculty/staff.

Evidence of Industry Validation and Participation in Assessment (for CTE programs only)

Provide documentation that the Program has submitted evidence and achieved certification or accreditation from an organization granting certification in an industry or profession. If the program/degree/certificate does not have a certifying body, you may submit evidence of the program's advisory committee's/board's recommendations for, approval of, and/or participation in assessment(s). **Please attach copy of industry validation for the year under review and submit with the document.**

Courses Assessed

- List all program courses assessed during AY 2015-16, including those courses for which a follow-up "Closing the Loop" assessment was implemented during the review year.

Assessed Course Alpha, No., & Title	Semester assessed	CLOs assessed (CLO# & text)	CLO-to-PLO alignment (aligned PLO# & text)
ITS 108	Spr, 2016	3. Demonstrate the ability to install, support, and troubleshoot the Windows operating systems. 4. Demonstrate the ability to support and troubleshoot Windows on networks and the Internet.	2. Networking: Plan, develop, and implement the hardware, software, and procedural components of a data communications system in a business environment. 4. Productivity: Work independently and cooperatively to deliver reports, programs, projects, and other deliverables that

			document a business organization's information technology requirements.
ITS 284	Spr, 2016	5. Categorize numerous networking topics and methods using the OSI Reference Model as a conceptual framework. 6. Understand the convergence of network and network security and perform design activities for networks of increasingly greater scope and complexity.	2. Networking: Plan, develop, and implement the hardware, software, and procedural components of a data communications system in a business environment. 4. Productivity: Work independently and cooperatively to deliver reports, programs, projects, and other deliverables that document a business organization's information technology requirements.
ITS 215	Fall 2016	3. Organize an effective network structure and carry out those responsibilities effectively on a Windows Server 2008, Standard Edition network. 4. Demonstrate hands-on proficiency with the server tasks.	2. Networking: Plan, develop, and implement the hardware, software, and procedural components of a data communications system in a business environment. 4. Productivity: Work independently and cooperatively to deliver reports, programs, projects, and other deliverables that document a business organization's

			information technology requirements.
"Closing the Loop" Assessments Alpha, No., & Title	**Semester assessed**	**CLOs assessed (CLO# & text)**	**CLO-to-PLO alignment (aligned PLO# & text)**
N/A			

Assessment Strategies

For each course assessed in AY 2015-16 listed above, provide a brief description of the assessment strategy, including:	
a description of the type of <u>student work or activity assessed</u> (e.g., research paper, lab report, hula performance, etc.);	In ITS 108, Computer Software Support, student research reports and group homework assignments were assessed. In ITS 284, Data Communications Fundamentals, student research reports and group homework assignments were assessed. These assessments were compared with a similar assessment of ITS 215, Network Administration, carried out the previous year. All three courses included networking, with the two higher level courses focused on this subject. The focus the past two years on networking is part of a long term plan to assess the various concentration areas within the program. Past and future assessments have/will focus on other concentration

	areas, such as programming, data management and cybersecurity.
a description of who conducted the assessment (e.g., the faculty member who taught the course, or a group of program faculty, or the program's advisory council members, etc.);	ITS 108 was taught by a lecturer, and ITS 284 was taught by the full time faculty member, Annie Brown. The assessments were made by the members of the IT Program Advisory Committee; these included six professionals practicing in the local community.
a description of how student artefacts were selected for assessment (did the assessment include summative student work from all students in the course or section, OR were student works selected based on a representative sample of students in each section of the course?);	Work from all students in the two classes were included in the assessments. Assignments to be reviewed were chosen to represent all major areas covered by the courses, including individual and group work, and assignments from throughout the semester.
a brief discussion of the assessment rubric/scoring guide that identifies criteria/categories and standards.	The rubric for each assignment from each reviewer was assessed in four areas: Specifications, Design, Readability, and Quality of Work. The assessments were for: Exceeds Expectations, Meets Expectations, or Does Not Meet Expectations.

Expected Levels of Achievement

- For each course assessed in AY 2015-16, indicate the benchmark goal for student success for each CLO assessed.
  - example 1: "85% of students will Meet Standard or Exceed Standard for CLO#1";
  - example 2: "80% of students will attain Competency or Mastery of CLO#4."

Assessed Course Alpha, No., & Title	Benchmark Goal for Student Success for Each CLO Assessed
ITS 108	85% of students will meet or exceed expectations for the four characteristics on the rubric. The assessment is intended to focus on PLO #2: "Networking: Plan develop and implement the hardware, software, and procedural components of a data communications system in a business environment."

ITS 284	85% of students will meet or exceed expectations for the four characteristics on the rubric. The assessment is intended to focus on PLO #2: "Networking: Plan develop and implement the hardware, software, and procedural components of a data communications system in a business environment."

Results of Course Assessments

For each course assessed in AY 2015-16:	
provide a description of the summative assessment results in terms of students' attainment of the CLOs and aligned PLOs.	ITS 108 is a first semester course, while ITS 284 is usually taken in a student's fourth and final semester. Each assignment was graded on four characteristics - specifications, design, readability, and quality of work - and the assessment was on a three point scale: exceeds expectations, meets expectations, and does not meet expectations. The reviewers were advised that expectations should be higher for student work in the ITS 284 course than for beginning students in the ITS 108 course. The total summed scores from the reviewers were quite high. For ITS 108, 49.1% of scores were for exceeding expectations, 46.3 % met expectations, and only 4.6 % did not meet expectations. For ITS 284, 48.9 % exceeded expectations, 46.8 % met expectations, and only 4.3 % did not meet expectations. Thus, these reviews show that the program exceeded its goal of 85 % of students meeting or exceeding expectations. In the previous year, external reviewers assessed student work in ITS 215, a third semester course that prepares students to take ITS 284. Results for ITS 215 was similar to the courses assessed this year: 36.3 % of students' work was judged as exceeding expectations, 56 % was rated as meeting expectations, and only 7.7 % of the students' work was judged as not meeting expectations. These courses included networking, with the two higher level courses focused on this subject. These reviews provide strong evidence that students are able to meet learning objectives for the courses at all levels of the IT program, with these particular assessments primarily examining student success in learning networking theory and practice.

	Note: Because of the strong background and training in networking, two of our current graduates were hired right after their IT internship program into a full time position at HPM. Their supervisor is extremely happy with their solid performance both in their technical and people skills. There is a high probability that HPM will hire another of our graduates when there is an opening at the end of the year.

Other Comments

Include any additional information that will help clarify the program's course assessment results.	
Include comparisons to any applicable College or related UH-System program standards, or to any national standards from industry, professional organizations, or accrediting associations.	N/A
Include, if relevant, a summary of student survey results, CCSSE, e-CAFE, graduate-leaver surveys, special studies, or other assessment instruments used that are not discussed elsewhere in this report.	N/A

Next Steps – Assessment Action Plan

Describe the program's intended next steps to improve student learning, based on the program's overall AY 2015-16 assessment results. Include any specific strategies, tactics, activities, or plans for instructional change, revisions to assessment practices, and/or increased student support.	
Instructional changes may include, for example, revisions to curriculum, teaching methods, course syllabi, course outlines of record (CORs), and other	Expand student recruitment, especially with the assistance of a second full time faculty member. Planning will commence on expansion of cybersecurity offerings.

curricular elements.	
Proposals for program modifications may include, for example, re-sequencing courses across semesters, or re-distribution of teaching resources, etc.	N/A. Program changes have been accomplished recently to add the Cybersecurity certificate. There may be a need to re-sequence the cybersecurity curriculum if and when new course offerings are introduced in the future.
Revisions to assessment strategies or practices may include, for example, revisions to learning outcome statements (CLOs and/or PLOs), department or course assessment rubrics (criteria and/or standards), development of multi-section/course summative assignments or exams, etc.	None planned at this time.
Student support and outreach initiatives may include, for example, wrap-around student services, targeted tutoring and/or mentoring, etc.	Expanded recruitment activities planned. Addition of a new faculty member will enable more time to work individually with students outside the classroom in tutoring, advising, and other assistance.

Part VI. Cost Per SSH

Please provide the following values used to determine the total fund amount and the cost per SSH for your program:

General Funds = $_____
Federal Funds = $_____
Other Funds = $_____
Tuition and Fees = $_____

Part VII. External Data

If your program utilizes external licensures, enter:

Number sitting for an exam _____
Number passed _____