

Instructional Comprehensive Program Review: Biotechnician (CA) 2016 – 2019

College Mission Statement

Kapi‘olani Community College provides students from Hawai‘i’s diverse communities open access to higher education opportunities in pursuit of academic, career, and lifelong learning goals. The College, guided by shared vision and values, and commitment to engagement, learning, and achievement, offers high quality certificate, associate degree, and transfer programs that prepare students for productive futures.

Program Mission Statement

The Arts & Sciences academic cluster provides high-quality and innovative programs that prepare students to meet rigorous baccalaureate requirements and personal enrichment goals, pursue lifelong learning, and lead lives of ethical, responsible community involvement.

Part I: Executive Summary of CPR and Response to previous program review recommendations

The Biotechnician Certificate of Achievement (BIOT CA) is an unusual program for several reasons. Since many of the Biotechnician certificate students are primarily enrolled as majors in Medical Laboratory Technician (MLT) program or other Science, Technology, Engineering and Mathematics (STEM) disciplines like the ASNS in Life Science, students do not usually declare BIOT CA as a major. Instead, they typically request the certificate during the semester in which they complete the proscribed coursework for the certificate, and much of this coursework does double duty also fulfilling requirements their MLT or STEM majors. Also, there are no dedicated BOR-appointed faculty and no BIOT alpha courses specific for the degree. Furthermore, since these unusual program characteristics don’t really match the measurement rubrics of the Annual Review of Program Data (ARPD), the data reported in previous ARPDs are unreliable and not particularly useful.

The certificate is popular particularly among undergraduate research students in microbiology and molecular biology and a number BIOT CA students have continued on to the Associate in Science in Natural Sciences (ASNS) degree program and have transferred to baccalaureate degree programs. This has led to an increase in the graduation and transfer rates to the four-year institutions.

Recent discussions in response to the emerging needs for research technicians, has considered reframing the certificate with a focus on developing a certificate for biotechnology research technicians within the Associate in Science in Natural Science (ASNS).

Part II: Program Description

History

The Arts & Sciences program was established in 1965 when Kapi‘olani Technical School was converted into Kapi‘olani Community College.

The Arts & Sciences (A&S) academic cluster is composed of four units: Arts & Humanities; Languages, Linguistics and Literature (originally referred to as “Language Arts”); Math and Sciences; and Social Sciences. With a staff and faculty numbering well over 200 and responsibility for over 70% of the College’s overall SSH enrollment, the A&S cluster is the single largest organizational unit at Kapi‘olani Community College. A&S offers courses in support of General Education, transfer to a four-year university, as well as select career programs intended to lead to immediate employment.

At Kapi‘olani Community College, students can graduate with an Associate in Arts (AA) degree, ASNS degree, complete subject certificates, transfer into a college or university, and continue as lifelong learners. The Ka‘ie‘ie dual enrollment program provides a new pathway to a four-year degree by providing pre-admission to a select group of Kapi'olani CC students.

The BIOT CA program, proposed in 2004, is designed to prepare students for employment in the Biotechnology industry and research. During their course of study students learn basic laboratory skills in molecular biology, microbiology and tissue culture, equipment operation and maintenance, quality control, safety and good manufacturing practices.

The BIOT CA is a small program with no dedicated BOR-appointed faculty and no dedicated facilities. The Program is intended as an optional “add-on” credential either for students enrolled in other STEM majors or for students in the MLT Program, to enhance their skill set and prepare them for cutting edge work in biotechnology. The curriculum is streamlined and articulated; all courses required for the BIOT CA may also be taken to meet the ASNS and/or MLT program requirements.

Currently the entire BIOT program is under review for possible realignment as a track within the ASNS degree.

Program Goals

1. Become the leading indigenous-serving higher education institution & support the access & success of Native Hawaiian students;
2. Increase the educational capital of the state by increasing the participation and degree completion of students;
3. Address critical workforce shortages and prepare students for effective engagement and leadership;
4. Recognize and invest in faculty and staff and develop innovative learning environments in which to work

Program Student Learning Outcomes (SLO)

The Biotechnician Certificate of Achievement Program Student Learning Outcomes are:

- Perform highly technical procedures such as cell counting, DNA extraction and characterization, cloning, PCR, ELISA and other immunological techniques, maintenance of cell lines, protein isolation and purification
- Conduct research experiments following operations and safety protocols and

- apply knowledge of theory and techniques sufficient to troubleshoot appropriately
- Analyze and display data using computer technology
- Manage laboratory activities, including record keeping, ordering supplies and preparing reports
- Apply successful problem solving skills in working with biological, chemical or radioactive hazards

Admissions Requirements

N/A

Credentials and Licensures offered:

N/A

Faculty and Staff

There are no faculty dedicated to this program.

Resources

The bulk of the funds used to support the facilities and the curricular offerings utilized by the BIOT CA are from the general (state) funds as awarded by the Hawai'i State Legislature. There is also significant budgetary and in-kind support from non-resident (ESOL program) tuition revenue, U.S. Department of Education, Title III, National Science Foundation, National Endowment for the Humanities, ARRA/Achieving the Dream and various other external sources. All of this funding is allocated to the four departments which comprise the Arts and Sciences Division and which contribute to the BIOT CA program. There are no funds that are awarded specifically to BIOT CA program.

The program has been successful in securing extramural funds particularly from NIH – INBRE and NSF-EPSCOR. The money has been used to fund stipends for students doing research projects and purchase equipment and supplies that are also used in other biology and microbiology classes. The program has also established a Monoclonal Antibody Service Facility and Training Center (MASFTC) in which biotech students help make antibodies for research investigators throughout the University community. The MASFTC pays student helpers and supports itself by charging investigators a fee for the service.

Articulation Agreements

Recognizing the primacy of in-system transfer, Kapi'olani has signed articulation agreements with three University of Hawai'i campuses: UH Mānoa, UH Hilo, and UH West O'ahu. The college has also secured articulation agreements with Chaminade University of Honolulu, Pacific University, Oregon State University, and Lamar University.

A MOU has been established with the Biology Program at UH Manoa. This MOU stipulates that the Biology Program will accept MICR 230 as equivalent to the Molecular

Biology Laboratory course BIOL 275L offered at UH Manoa. MICR 230 and MICR 240 are fully articulated and transferrable into baccalaureate degree programs. MICR 161 is a required course in the MLT program.

Advisory and Community Connections

Hawai‘i Department of Education, National Science Foundation, U.S. Department of Education, State of Hawai‘i, State of Hawai‘i DBEDT, PCATT, ARRA/Achieving the Dream

Community connections, advisory committees, Internships, Coops, DOE

National Science Foundation, U.S. Department of Education, State of Hawai‘i, State of Hawai‘i Department of Education, DBEDT, PCATT, ARRA/AtD

Part III: Curriculum Revision and Review

All of the majors courses in the BIOT CA degree have been revised and updated and are therefore in compliance with the 5-year review.

Undergraduate research is one of the best practices for student success, retention and graduation. Classes such as MICR 230 are now designated as RI (research intensive) and include imbedded research projects as part of the curriculum. Other courses such as MICR 161 and MICR 240 are pursuing similar designation.

Part IV: Survey Results

No student exit survey has been conducted for the program.

Part V: Quantitative Indicators for Program Review (ARPD for 2012-2013, 2013-2014, 2014-2015)

	Demand	Efficiency	Effectiveness	Overall
2012 - 2013	Unhealthy	Cautionary	Healthy	Cautionary
2013 - 2014	Cautionary	Cautionary	Healthy	Cautionary
2014 - 2015	Healthy	Unhealthy	Healthy	Cautionary

The following is an analysis of quantitative trends identified over the past three years of ARPD data:

Demand Indicators

The BIOT CA is a small program. Since many of the Biotechnician certificate students are primarily enrolled as majors in MLT or other STEM disciplines, students do not necessarily declare BIOT CA as a major. Rather they often informally decide to take it on as they progress through their primary major and then apply for the certificate during the semester in which they graduate. Thus the number of majors as reported in the

ARPD is unreliable.

Efficiency Indicators

There are no FTE BOR appointed faculty in the program, nor are there any courses that are exclusively taken by students in this program. The faculty teaching the majors courses are FTE BOR appointed faculty in the AA and ASNS program and lecturers. Thus the student faculty ratio will remain unhealthy.

Effectiveness Indicators

There are no BIOT alpha courses for the Biotechnician CA program. Thus the numbers reported for the Effectiveness Indicator in the ARPD is unreliable. The courses taken by the majors are the same course taken by the ASNS and MLT majors.

Distance Education: Completely Online Courses

There are no online classes offered in the program. Hands-on laboratory experience is essential for majors in the BIOT CA program.

Part VI: Analysis of the Program

Alignment with mission

The BIOT CA program is an option either for the students enrolled in STEM majors or the students enrolled in MLT Program to enhance the skill set and prepare them for cutting edge work in biotechnology. Numerous BIOT students have also pursued ASNS-Life Science degrees and then transferred to Baccalaureate degree programs at UH-Manoa in either Microbiology, Molecular and Cell Biology, or Molecular Biosciences and Biotechnology. We interpret this as success.

We are currently discussing possibly reframing this certificate program within the Associate in Science in Natural Science.

Current Situation: Internal

We believe that the ARPD Quantitative Indicators do not adequately represent the effectiveness and efficiency of this small program that has no budget, no dedicated faculty and no designated BIOT alpha courses. What is not reflected in the ARPD data is that this small program very efficiently cobbles existing courses into a program that is consistently at the vanguard of the undergraduate research efforts at KCC and that consistently and effectively trains students for work as entry level biotechnology research technicians and effectively prepares them for transfer to four-year degree programs in molecular biology and biotechnology.

The most significant internal threat to all the laboratory sciences and the undergraduate research program at KCC is the ongoing lack of space that can be dedicated to Natural Sciences use. Appropriate adequate laboratory spaces that allow for biological and chemical safety, laboratory grade water, drainage, ventilation, work-bench space,

preparation space, and storage are not available. Congruently the APT laboratory technician staffing for all the laboratories offered in the Math/Science Department is very limited. In a typical semester the department offers 80-100 laboratory sections serving 1600-2000 students. ALL of the preparations, (making solutions, ordering, preparing media, maintaining microbial stocks, washing and preparing glassware, maintaining equipment such as incubators, spectrophotometers, water still, autoclaves, etc., etc.) for these lab classes are handled by only two APT's. This is unsustainable and it has significant safety and compliance implications.

This CPR has identified this lack of both staffing and dedicated space as a factor that will continue to limit the potential expansion of all laboratory programs of study in Natural Sciences.

Current Situation: External

Following a review of “Kapi‘olani Community College, University of Hawai‘i, Strategic Plan: Mission, Vision, Values, and Commitments 2015-2021,” the Biotechnician CA is committed to all four strategic outcomes: Graduation and student success, Innovation, Enrollment growth, and modern, sustainable, teaching and learning environments.

Assessment Results for Program SLO's

In 2014-2015, all of the Program Student Learning Outcomes (PSLOS) were assessed. The assessment rubric developed in consultation with the Arts and Sciences Assessment Coordinator was used. Student learning artifacts evaluated included lab reports, quizzes, exams, and final examination. Results indicated that for all PSLOs, 100% of students performed at 80% accuracy or better.

Part VII: Tactical Action Plan, 2016-19

There are no specific changes being contemplated. The Biotechnician CA successfully trains students for work as entry-level biotechnology research technicians and effectively prepares them for transfer to four-year degree programs in molecular biology and biotechnology. The program will continue along these directions. The program also successfully attracts and is awarded extramural funds. The program will also continue to pursue such funding.

Kapiolani Community College Strategic Plan Outcomes and Performance Measures, 2015 – 2021.	ASNS Strategies
<p>Outcome 1 Hawai‘i Graduation Initiative: Focus on Students (E) Increase annual STEM certificate and degree completers at KCC and UH 4-year by 5 % from 166 to 243</p> <p>Outcome 2 Hawaii Innovation Initiative: Productive Futures for Students, Faculty and Staff (measured by ARPD data)</p>	<p>Institutionalize peer mentoring program at the STEM Center</p> <p>Institutionalize and solidify STEM URE through:</p> <ul style="list-style-type: none"> • APT position URE

<p>(g) Increase the annual number of students participating in the ASNS degree by 6% from 356-535.</p> <p>(h) Increase the number of ASNS students transferring to UH 4-year campuses by 6% from 42 to 64.</p> <p>(i) Increase the annual number of students completing ASNS undergraduate research experiences and research internships by 10% from 70 – 136,</p> <p>(j) Increase the annual number of students completing the ASNS degree by 10% from 30 to 60.</p>	<p>coordinator</p> <ul style="list-style-type: none"> • Dedicated space for URE • Additional lab technician <p>Hire a Math full-time faculty position, since lack of math skills is affecting student persistence and degree completion.</p> <p>Institutionalization of peer and PLUS mentors for ASNS courses.</p>
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Positions Responsible	Synergies with other programs, units, emphases and initiatives
Faculty Department Chairs APT Staff STEM Center staff Assessment Coordinator(s) Secretaries Dean	Maida Kamber Center CELTT, Library, & Testing, Achieving the Dream initiative & Title III, Student Services, CTE and Health Academic Clusters, BLT Department, Ka‘ie‘ie and other university pathways, OFIE and Service Learning, Business Office, Human Resources Office

Part VIII: Resource and Budget Implications

BIOT CA has no dedicated budget as it is comprised of courses that already exist within the Arts and Sciences Division, thus it is supported by resource requests that will continue to be made for them by the Arts & Sciences Division as a whole.