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## University of Hawaii Community Colleges

### Annual Report of Program Data Analysis Preview

[\(click here to print\)](#)**PREVIEW**

#### College: Kauai Community College

#### Program: Natural Science

Program did not provide date of the last comprehensive review.



### Program Description

The purpose of the Associate of Science in Natural Science (ASNS) degree is to address the needs of students interested in science, technology, engineering, and mathematics (STEM). Students can use the AS degree in Natural Science to better market their science background or in preparation for transfer to a four year institution. The ASNS in Biological Sciences provides a clear pathway to properly prepare students for transfer with core introductory courses and labs in biology, chemistry, and physics typically required in the first two years of a broad range of biological science baccalaureate degrees at four-year universities. The ASNS in Physical Sciences provides a clear pathway to properly prepare students for transfer with core introductory courses and labs in chemistry, mathematics, and physics typically required in the first two years of a broad range of physical science baccalaureate degrees at four-year universities.

### Part I. Quantitative Indicators

## Overall Program Health: **Cautionary**

Majors Included: NSCI Program CIP: 30.1801

Demand Indicators		Program Year			Demand Health Call
		12-13	13-14	14-15	
1	Number of Majors	0	9	15	<b>Healthy</b>
1a	Number of Majors Native Hawaiian	0	1	2	
1b	Fall Full-Time	0%	75%	47%	
1c	Fall Part-Time	0%	25%	53%	
1d	Fall Part-Time who are Full-Time in System	0%	0%	0%	
1e	Spring Full-Time	0%	46%	23%	
1f	Spring Part-Time	0%	54%	77%	
1g	Spring Part-Time who are Full-Time in System	0%	0%	15%	

2	*Percent Change Majors from Prior Year	0%	0%	76.4%
3	SSH Program Majors in Program Classes	0	8	46
4	SSH Non-Majors in Program Classes	0	290	390
5	SSH in All Program Classes	0	298	436
6	FTE Enrollment in Program Classes	0	10	15
7	Total Number of Classes Taught	0	16	21

Efficiency Indicators		Program Year			Efficiency Health Call
		12-13	13-14	14-15	
8	Average Class Size	0	9	9.4	<b>Unhealthy</b>
9	*Fill Rate	0%	50.3%	58.2%	
10	FTE BOR Appointed Faculty	0	5.9	5	
11	*Majors to FTE BOR Appointed Faculty	0	1.4	3	
12	Majors to Analytic FTE Faculty	0	7.0	9.2	
12a	Analytic FTE Faculty	0	1.2	1.6	
13	Overall Program Budget Allocation	Not Yet Reported	Not Reported	Not Yet Reported	
13a	General Funded Budget Allocation	Not Yet Reported	Not Reported	Not Yet Reported	
13b	Special/Federal Budget Allocation	Not Yet Reported	Not Reported	Not Yet Reported	
13c	Tuition and Fees	Not Yet Reported	Not Reported	Not Yet Reported	
14	Cost per SSH	Not Yet Reported	Not Reported	Not Yet Reported	
15	Number of Low-Enrolled (<10) Classes	0	10	14	

\*Data element used in health call calculation

Last Updated: October 7, 2015

Effectiveness Indicators		Program Year			Effectiveness Health Call
		12-13	13-14	14-15	
16	Successful Completion (Equivalent C or Higher)	0%	87%	84%	<b>Unhealthy</b>
17	Withdrawals (Grade = W)	0	11	6	
18	*Persistence (Fall to Spring)	0%	75%	52.9%	
18a	Persistence Fall to Fall	0%	50%	23.5%	
19	Unduplicated Degrees/Certificates Awarded Prior Fiscal Year	0	0	0	
19a	Associate Degrees Awarded	0	0	0	
19b	Academic Subject Certificates Awarded	0	0	0	
19c	Goal	0	0	-9,999	
19d	*Difference Between Unduplicated Awarded and Goal	0%	N/A	-100%	
20	Transfers to UH 4-yr	0	0	0	
20a	Transfers with degree from program	0	0	0	
20b	Transfers without degree from program	0	0	0	
20c	Increase by 3% Annual Transfers to UH 4-yr Goal	0	0	0	
20d	*Difference Between Transfers and Goal	0%	0%	0%	

Distance Education: Completely On-line Classes		Program Year		
		12-13	13-14	14-15

21	Number of Distance Education Classes Taught	0	0	0
22	Enrollments Distance Education Classes	N/A	N/A	N/A
23	Fill Rate	N/A	N/A	N/A
24	Successful Completion (Equivalent C or Higher)	N/A	N/A	N/A
25	Withdrawals (Grade = W)	N/A	N/A	N/A
26	Persistence (Fall to Spring Not Limited to Distance Education)	N/A	N/A	N/A

Performance Funding		Program Year		
		12-13	13-14	14-15
27	Number of Degrees and Certificates	0	0	0
28	Number of Degrees and Certificates Native Hawaiian	0	0	0
29	Number of Degrees and Certificates STEM	0	0	0
30	Number of Pell Recipients	0	2	4
31	Number of Transfers to UH 4-yr	0	0	0

\*Data element used in health call calculation

Last Updated: October 7, 2015

### Glossary | Health Call Scoring Rubric

## Part II. Analysis of the Program

Initial results for this new program are very encouraging. The number of declared majors is more than anticipated and growing steadily. Other indications of growth are described below. Efficiency Indicators, Effectiveness Indicators, and other indicators of health results are spurious because the metrics require adjustment. Interpretation of other aspects of program health is further complicated by the small (but growing) numbers in this brand new program.

The program began in 2013-2014 with nine students and grew to 15 in 2014-2015. This is four more and five more majors for each respective year than anticipated when the program was proposed. Yet, there are other clear signs the program is even stronger. Many more students are enrolling in ASNS courses geared specifically for science majors but many of these students are not choosing ASNS as their major for reasons addressed later in this document.

Enrollment in relatively challenging courses specifically for science majors suggests the current number of science students seeking to transfer to a 4-year institution is closer to 40, which would be almost three times the projected number for 2015-2016. The ASNS requires a full year of chemistry and chemistry labs geared for science majors (CHEM 161/161L and CHEM 162/162L). These courses had been offered at Kauai CC before implementing the ASNS. But, they were taught just once every other year. When the chemistry sequence was offered in consecutive years for the first time in 2014-2015, the course not only filled but had a waitlist. In Fall 2014, 23 students completed CHEM 161 and there are 25 students currently enrolled in Fall 2015. Students self-report an interest in pursuing a science major. Thus, there are likely about 35-45 target students accounting for those interested in a science degree at Kauai CC who have not yet taken the chemistry and those who took it in 2014 and moved on.

## Part III. Action Plan

### Action Plan I: Increase declared ASNS majors

Program Goal	Action Item	Resources Needed	Person(s) Responsible	Timeline	Indicator of Improvement	Status
Increase ASNS majors	1.1 Simplify degree requirements	Release Time	ASNS Coordinator	2016-2017	Changes approved	New
"	1.2 Outreach to KCC science students		ASNS Coordinator	Ongoing	Higher percentage of students in courses for science majors enrolled in ASNS	New
"	1.3 Outreach to high school students	Data	ASNS Coordinator	Ongoing	More local high school students enrolling in ASNS	New

1.1 The ASNS degree requirements should be streamlined and simplified to make it a more attractive, flexible, and useful option for students. Many KCC students interested in pursuing a science degree are not enrolled in the ASNS program. Through discussions with students and counselors and review of program requirements, students are not enrolling because Kauai CC's ASNS program includes course requirements that are unnecessary. These requirements should be eliminated to allow maximum flexibility for students. For example, KCC requires 13 natural science credits outside of the core requirements like Chemistry. KCC requires more than any other UHCC ASNS program. For many students, none of these other Natural Science courses will help them toward their major and are thus a disincentive to enroll and barrier to completion. We could replace the 13 additional natural science credits with simply 13 credits of the students' choice so that they can meet the requirements they need for their prospective academic ambitions. There are other similar, though less significant issues with requirements that will be addressed and reviewed by the appropriate approval bodies (e.g. SAM Division, Curriculum Committee, etc.) in consultation with representatives of other UHCC ASNS programs.

1.2 & 1.3 Outreach to current students will seek to ensure they are aware of the changes and invite them to sign up to the ASNS. Outreach to local high schools will seek to ensure students interested in science know KCC is a viable option and advertise the advantages of earning an ASNS on Kauai before transferring to a 4-yr degree program.

#### Action Plan II: Timely Graduation and Increased Transfers

Program Goal	Action Item	Resources Needed	Person(s) Responsible	Timeline	Indicator of Improvement	Status
Timely Graduation and Transfer	2.1 Scheduling	Data	ASNS Coordinator, ASNS Faculty Members, and Office of VCAA	Ongoing	Students can complete degrees in 2 years	New
"	2.2 Annual offering of all core required course sequences	SAM Faculty + 2 positions	SAM Division Faculty	Ongoing	All core course sequences offered annually	Ongoing
"	2.3 Hire Biology/Marine Biology Instructor	1 FTE position	SAM Division Chair	F 2016	Fill vacant position to fulfill faculty needs for courses	Ongoing
"	2.4 Hire Physical Science Instructor	1 FTE position	SAM Division Chair	F 2016	Fill vacant position to fulfill faculty needs for courses	Ongoing

2.1-2.4 Timely graduation and transfer requires effective scheduling and course offerings to meet students' needs. ASNS faculty will work with the Office of the VCAA and counselors to develop, review, and modify a 2-year plan. Actually offering the courses presents a bigger problem. As mentioned in the APRU for the Liberal Arts program, the program has struggled to acquire and maintain a suitable lecturer in Biology required for ASNS Biological Science majors. The two physical science faculty have had to take on overloads, juggle their schedule, and pass up opportunities to offer popular Liberal Arts general education science courses to offer all required core ASNS science courses each year (i.e. CHEM 161/162 sequence and PHYS 170/272 sequence). Please refer to the discussion in "Part IV Resource Implications" of the Liberal Arts program APRU for justification of the need to hire full-time biological and physical science instructors.

#### Action Plan III: Improve Student Success

Program Goal	Action Item	Resources Needed	Person(s) Responsible	Timeline	Indicator of Improvement	Status
Improve Student Success	3.1 Coordinate course content		ASNS Faculty	Ongoing	Well-coordinated content across Math-Physics and Chemistry-Biology courses	Ongoing
"	3.2 Hire STEM tutors	Student workers	STEM Coordinator / Tutor Center	Ongoing	STEM tutors employed	Ongoing
"	3.3 Equipment: DC power supplies	\$5000	ASNS Coordinator	Ongoing	Equipment purchased; allows for safe, effective chemistry and physics labs	New

3.1 Content will be coordinated by multiple faculty across different but related core ASNS courses to facilitate student success. For example, consider PHYS 170, the first semester of calculus-based physics for science majors. PHYS 170 students are typically enrolled concurrently in calculus (MATH 205). But, the two main calculus concepts, differentiation and integration, their methods, and applications are introduced in all standard PHYS 170 textbooks before students encounter them in calculus. Integration concepts and applications are introduced long

before students see them in calculus. This problem occurs across the nation and is a sacrifice made for time of completion and course sequencing advantages for students. Ideally, students would have a full year of calculus before taking PHYS 170 but that would delay time of degree completion by an extra year. KCC does not want to change the course sequencing but students could benefit from careful coordination between the physics and calculus teachers to reinforce student understanding and minimize confusion. Similar coordination will benefit Biological Science students taking both BIOL 171 and CHEM 161, as chemistry plays a significant role in students' understanding of first-semester (BIOL 171) biology fundamentals.

3.2 Peer tutors have proven helpful to student success. Hiring of science tutors is described and justified in the Liberal Arts APRU. It should be mentioned, however, that it will be difficult to find tutors with math skills and science background to handle ASNS courses. If found, such tutors would prove valuable in helping science students in both the ASNS and Liberal Arts programs.

3.3 Science laboratory courses are equipment-intensive and require updating and replacement if for no other reason than to keep up with relevant technological platforms and skills in students' chosen field. One immediate need is for separate, high quality, low current DC and AC power supplies for electronics experiments and demonstrations (\$5000). This equipment is essential for the second semester of physics labs for science majors (PHYS 272L) but will also be useful for Liberal Arts and CTE science courses taught by SAM division faculty. The need for new laptop computers is covered in Liberal Arts APRU and will be used in science courses for Liberal Arts AA degree students as well. It should be noted that laptops are essential tools for lab data display and analysis used in almost every CHEM and PHYS lab meeting for ASNS majors.

#### Action Plan IV: Improve Program Management and Evaluation

Program Goal	Action Item	Resources Needed	Person(s) Responsible	Timeline	Indicators of Improvement	Status
Improve Program Management and Evaluation	4.1 Ensure Leadership	Release Time	ASNS Coordinator	Ongoing	Coordinator assigned	Ongoing
"	4.2 Change courses in ASNS performance evaluation	Release Time	ASNS Coordinator	2016	Metrics changed to reflect all/only relevant courses	New
"	4.3 Change faculty in ASNS performance evaluation	Release Time	ASNS Coordinator	2016	Metrics changed to reflect all/only relevant faculty	New
"	4.4 Align CSLOs, PSLOs, ISLOs	Release Time	ASNS Coordinator	2016-2017	SLOs aligned	New
"	4.5 Ensure formal approval of ASNS degree program	Release Time	ASNS Coordinator	S 2016	BOR approves program	New

4.1 The ASNS program needs a coordinator. Currently, nobody has a consistent, assigned responsibility for the ASNS, which stands in stark contrast to the Liberal Arts Program, academic divisions, English Program, Math Program, or even coordination of Writing Intensive courses, etc. A position with clear tasks and re-assigned time should be designated to ensure the ASNS programs' success. The ASNS coordinator will identify and address program needs, keep tabs on the program, and facilitate its success. At the very least, it would be preferable that someone have the responsibility and time to carry out or oversee many of the Action Items in this Action Plan section. Release time of 3-credits per semester is sought.

4.2 Course and faculty information used for program evaluation should be changed. Without these changes, the Overall Program Health Indicators defy meaningful interpretation. Currently, any faculty member who teaches a course in the field of Natural Science is listed as ASNS degree program faculty, even if some of those faculty do not teach any courses in the ASNS degree program (e.g. Botany is a natural science but there are no Botany courses in the ASNS; the respective faculty members should not count as a FTE faculty members assigned to the ASNS degree program as they currently are). On the other hand, the efforts of faculty who teach calculus, a core requirement of the ASNS degree program, are not counted toward the ASNS degree program. Their efforts for MATH 205 and 206 might best be classified in the ASNS degree program.

4.3 Similarly, some courses (e.g. Botany) are included as ASNS degree program courses for Demand, Efficiency, and Effectiveness Indicators. These should not be included, while perhaps MATH 205 and 206 (Calculus) should. The efforts of relevant ASNS faculty will also need to be clearly delineated. Required and elective courses in the ASNS program constitute a minority of the annual teaching equivalency for every appropriate "ASNS" faculty member. All ASNS faculty still primarily teach courses in the Liberal Arts or other programs.

4.4 There are issues with alignment of Course, Program, and Institutional Learning Outcomes (CSLOs, PSLOs, and ISLOs). For example, SCI 170 is the only course in the program addressing two ISLOs on teamwork and ethics. But, the UHCC system did not approve of SCI 170 as a requirement KCC's ASNS program because it is not a requirement for any degree at UH Manoa. It will have to be removed from KCC's program. Thus, the two ISLOs will need to be met by other courses in the ASNS program. Other alignment issues will be discussed with other UHCC ASNS programs. Any changes must be shepherded through all appropriate campus approving bodies.

4.5 The ASNS is at the end of its 3-yr probationary status and must vie for formal, permanent recognition by the BOR in spring 2016. The ASNS coordinator will work with other UHCC representatives and the Office of the VCAA for joint program approval.

## Part IV. Resource Implications

The ASNS Coordinator is responsible for the success of the program. The coordinator is responsible for all items in Action Plans I & IV and plays a key role in Action Plans II and III. Included are critical changes needed and some that promise to greatly expand the program. The program will apply for formal approval in spring 2016 and will need someone to develop KCC's documents and coordinate with the other UHCC ASNS programs. Three credits per semester of re-assigned time is sought.

The biological science and physical science prospective hires are described and justified in the Liberal Arts program APRU. While essential for the ASNS, the prospective hires will be teaching predominantly courses for Liberal Arts and other programs outside of the ASNS. Please refer to Part IV, Resource Implications of the Liberal Arts program APRU. The hiring of STEM tutors is also described and justified in the Liberal Arts Program APRU.

Separate, high quality, low current DC and AC power supplies are needed for electronics experiments and demonstrations (\$5000). This equipment is essential for the second semester of physics labs for science majors (PHYS 272L) but will also be useful for Liberal Arts and CTE science courses taught by SAM division faculty. The need for new laptop computers is covered in Liberal Arts APRU and will be used in science courses for Liberal Arts AA degree students as well. It should be noted that laptops are essential tools for lab data display and analysis used in almost every CHEM and PHYS lab meeting for ASNS majors.

Required ASNS Courses

Courses	Offerings per year	Teaching Equivalency
*BIOL/MARE 171/171L	1	5.5
*BIOL/MARE 172/172L	1	5.5
CHEM 161/161L	1	5.5
CHEM 162/162L	1	5.5
MATH 205	1	4
MATH 206	1	3
*PHYS 151/151L	1	5.5
*PHYS 252/252L	1	5.5
PHYS 170/170L	1	6.5
PHYS 272/272L	1	5.5

\*The BIOL and MARE courses are cross-listed and taught concurrently. The PHYS 151/252 lecture and lab sequence is not likely to be offered again until a new physical science instructor is hired.

Please note that all ASNS faculty will be needed to teach courses in other programs, primarily in the Liberal Arts program. Please see the Liberal Arts APRU Action Plan IV for justification and quantification of teaching loads for current ASNS faculty and prospective hires.

## Program Student Learning Outcomes

For the 2014-2015 program year, some or all of the following P-SLOs were reviewed by the program:

Assessed this	Program Student Learning Outcomes

year?		
<b>1</b>	<input type="radio"/> No	Analyze data effectively using currently available technology
<b>2</b>	<input type="radio"/> No	Communicate scientific ideas and principles clearly and effectively
<b>3</b>	<input type="radio"/> No	Analyze and apply fundamental mathematical, physical, and chemical concepts and techniques to scientific issues
<b>4</b>	<input type="radio"/> No	Apply fundamental concepts and techniques in their chosen natural science field of study, such as biology, chemistry, engineering, physics, etc.

### A) Expected Level Achievement

No content.

### B) Courses Assessed

No content.

### C) Assessment Strategy/Instrument

No content.

### D) Results of Program Assessment

No content.

### E) Other Comments

No content.

### F) Next Steps

No content.

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