

Comprehensive Program Review 2023



Associate of Science in Natural Science



UNIVERSITY of HAWAII®
KAUA'I
COMMUNITY COLLEGE

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

Program Name Associate of Science in Natural Science (ASNS)

Assessment Period: 2019-2023

Program or Unit Mission Statement (UHCCP 5.202)

The purpose of the Associate of Science in Natural Science (ASNS) degree is to address the needs of students interested in careers in science, technology, engineering, and mathematics (STEM). There are three ASNS concentrations: Biological Sciences, Physical Sciences, and Engineering. Each provides a clear pathway to properly prepare students for transfer with core introductory courses and labs in biology, chemistry, engineering, math, and physics typically required in the first two years of a broad range of science and engineering baccalaureate degrees at four-year universities. Students can use the AS degree in Natural Science to better market their science background for a science technician position or transfer to a four-year institution and prepare to join a larger and stronger STEM workforce in Hawai'i.

College Mission Statement (UHCCP 5.202)

Kaua'i Community College is a kahua that inspires, engages, and empowers learners and educators to enrich our community and our world.

The ASNS program supports the mission because the ASNS is an instructional program has produced graduates who have successfully completed the degree, transferred to a UH university, and entered and enhanced the STEM workforce benefitting Hawai'i.

Part I. Executive Summary of Program Status

Residents of Kaua‘i depend on Kaua‘i CC (KauCC) because it is the only institution of higher learning on the island. We continue providing Kaua‘i residents with the quality education needed to pursue important STEM careers to Kaua‘i and Hawai‘i. It is a positive sign that KauCC is able to run the program with enrollment, graduation and transfer numbers that compare favorably to ASNS programs at other UHCC’s when considering the small population of Kaua‘i and overall student enrollment at KauCC. The 2022-2023 academic year is the fourth full year since the ASNS program at KauCC was formally upgraded from “provisional” to “established” by the Board of Regents in spring 2019.

Part II. Program Description (UHCCP 5.202)

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| Number of Faculty and Staff | Faculty (FT): 3 (AY22-23, AY 21-22, AY20-21); 4 (AY19-20); 5 (AY18-19) |
| | Faculty (Lecturers): 1 (all years) |
| | Staff: 0-1 (Office assistant shared with Math and Science Division serving the larger AA in Liberal Arts program) |
| Date Website Last Reviewed/Updated | Fall 2023 |
| Brief History of Program | This is the first CPR. The ASNS at KauCC was formally upgraded from “provisional” to “established” by the Board of Regents in spring 2019. |

For Instructional Programs ONLY

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| Graduate Occupation or Transfer Options | There are three ASNS concentrations at KauCC: Biological Sciences, Physical Sciences, and Engineering. Each provides a clear pathway to properly prepare students for transfer with core introductory courses and labs in biology, chemistry, engineering, math, and physics typically required in the first two years of a broad range of science and engineering baccalaureate degrees at four-year universities. Students can use the AS degree in Natural Science to better market their science background for a science technician position or transfer to a four-year institution and prepare to join a larger and stronger STEM workforce in Hawai‘i. |
| Special Admission Requirements | None |
| Credentials Offered | Associate of Science degree |
| Current Program Articulation Agreements (Institution and Expiration Date) | Institution: UH Manoa (Ka‘ie‘ie transfer program) |
| | Expiration Date: |
| | Institution: |

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| | Expiration Date: |
| Distance Education Courses Offered | 9 DE courses in AY22-23; average of 11 DE courses per year over the last 5 years |
| Early College Courses offered (total number of sections/high school) | 25 Early College courses offered from AY19-20 through AY22-23 (14 sections at Kapa‘a HS, 7 sections at Waimea HS, and 4 sections at Kaua‘i HS) |
| Distance Education Programs offered | None |
| Current Advisory Board Members/Employer and last meeting date | Member Name: N/A |
| | Employer: |
| | Last Meeting Date: |
| Employer Internships | N/A |

Part III. Analysis of Quantitative Indicators

Instructional program [ARPD Program Quantitative Indicators](#) are included in **Tables 1-5**. Indicators denoted in bold were traditionally used by the UH system to categorize program health. Those metrics were considered overly simplistic. Further context will help to consider trends and implications. Impacts of COVID-19 complicate interpretation of any trends.

Demand Indicators (Table 1): Enrollment in fall 2022 is up 34%. The increase may represent recovery from a nadir of pandemic enrollment losses in 2021-2022. The increase in enrollment in the ASNS runs counter to an ongoing demographic reduction in high school graduates and a hiring boom as we emerge from the pandemic. The ASNS is the only transfer degree program at KauCC to increase its number of majors. National trends of declining community college enrollment of [15% since 2019](#) have been attributed to both fewer high school graduates and a reduced share of graduates opting for college or remaining in Hawai‘i. On Kaua‘i, a demographic shift toward fewer young adults makes it more challenging to increase enrollment. Almost all ASNS program students are aged 15-29 years old. The 15-29 year old demographic on Kaua‘i has decreased in population by 2% from 2018 to 2020, according to [2020 census data](#). That trend is projected to continue for a few more years before recovering. The ASNS program will continue to explore ways to improve enrollment and be accountable, as described further below.

Also noteworthy: The pandemic shift towards part-time enrollment is slowly reversing, which is relevant because part-time students not only take longer but are less likely to complete a degree. There was a large shift to part-time students (from 41% in 19-20 to 83% in 21-22). The trend was perhaps partially offset by the number of the students who are part-time at KauCC but still full-time students in the UH system. That pandemic shift is slowly reversing. Part-time enrollment decreased from 83% in 2021-22 to 66% in 2022-2023. Full-time enrollment is on the rise.

Table 1: ARPD Key Demand Indicators

| Demand Indicators | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|--|------------|-----------|------------|-------------|------------|
| Number of Majors | 42 | 43 | 41 | 32 | 38 |
| Number of Majors Native Hawaiian | 12 | 8 | 7 | 7 | 9 |
| Fall Full-Time | 60% | 59% | 49% | 17% | 34% |
| Fall Part-Time | 40% | 41% | 51% | 83% | 66% |
| Fall Part-Time but Full-Time in System | 7% | 3% | 2% | 25% | 17% |
| Spring Full-Time | 66% | 43% | 24% | 14% | 24% |
| Spring Part Time | 34% | 57% | 76% | 86% | 76% |
| Spring Part Time but Full-Time in System | 5% | 13% | 26% | 36% | 12% |
| Percent Change Majors from Prior Year | 30% | 2% | -5% | -21% | 17% |
| SSH Program Majors in Program Classes | 496 | 441 | 338 | 227 | 314 |
| SSH Non-Majors in Program Classes | 1078 | 946 | 1006 | 763 | 765 |
| SSH in All Program Classes | 1574 | 1387 | 1344 | 990 | 1079 |
| FTE Enrollment in Program Classes | 52 | 46 | 45 | 33 | 36 |
| Total Number of Classes Taught | 42 | 38 | 32 | 24 | 28 |

Efficiency Indicators (Table 2): Efficiency is holding relatively steady in all metrics over the past five years. Enrollment has been robust in core chemistry and physics courses. The most dramatic change is the reduction in low-enrolled courses. Enrollment has been relatively low in MATH 140X (pre-calculus), MATH 242 (Calculus II), and MATH 253 (advanced calculus covering the entire second year of calculus, MATH 243 and 244, in one semester). Enrollment in math is impacted by extensive offerings of MATH 140X as Early College courses, which removes the need for students to take MATH 140X at KauCC. Nevertheless, the Early College MATH 140X offerings are a net benefit to the ASNS program recruiting, time to completion, and completion (not to mention the benefits to the students).

The program made a conscious effort to reduce low-enrolled courses, which have been reduced from a peak of fifteen to as low as four. For example, visionary math faculty members created an accelerated advanced calculus course, MATH 253, which covers the entire second year of calculus (MATH 243 and MATH 244) in one semester. MATH 253 eliminates the need to offer the traditionally low-enrolled MATH 244. Preliminary results suggest the change has also led to a higher success rate of student completers. And the students finish in just one semester instead of two. The college embraces such win-win-win efficiency solutions that still permit students to take all of the courses necessary for degree completion.

Table 2: ARPD Key Efficiency Indicators

| Efficiency Indicators | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|--|--------------|------------|--------------|--------------|--------------|
| Average Class Size | 13 | 13 | 15 | 16 | 14 |
| Fill Rate | 54.5% | 55% | 63.2% | 62.7% | 60.2% |
| FTE BOR Appointed Faculty | 5 | 5 | 5 | 4 | 4 |
| Majors to FTE BOR Appointed Faculty | 8 | 8 | 8 | 8 | 9 |
| Majors to Analytic FTE Faculty | 8 | 10 | 13 | 10 | 12 |
| Analytic FTE Faculty | 5 | 4 | 3 | 3 | 3 |
| Number of Low-Enrolled (<10) Classes | 12 | 15 | 6 | 4 | 6 |

Effectiveness Indicators (Table 3): Effectiveness indicators show mixed signals. Kaua‘i CC continues to have the highest ASNS degree completion ratio (degrees/enrollment) in the UH system. A target for improvement is the number of degrees awarded and transfers. The numbers have been fairly steady for the past two years but are down from their combined peak in 2020-2021 when sixteen students either completed an unduplicated degree or transferred without the degree. Declining completion is expected since enrollment has also declined, i.e. fewer students leads to fewer graduates. Withdrawals are relatively high and persistence is relatively low, both fall to spring and fall to fall. There are still some structural and logistical barriers to degree completion. The barriers to degree completion and efforts to overcome them are addressed in the action plan.

Distance Indicators (Table 4): Program course offerings are slowly returning to more face-to-face instruction after moving almost entirely online during the pandemic. Pandemic concerns have greatly reduced and both instructors and students are slowly returning to the physical classroom. Campus surveys on student attitudes suggest students have mixed feelings; they generally see face-to-face instruction as a better option for learning but value the flexibility of online offerings.

Table 3: ARPD Key Effectiveness Indicators

| Effectiveness Indicators | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|-------------------------------------|------------|------------|------------|------------|------------|
| Successful Completion (C or Higher) | 86% | 89% | 82% | 78% | 80% |
| Withdrawals (Grade = W) | 28 | 18 | 14 | 19 | 24 |
| Persistence Fall to Spring | 69% | 79% | 68% | 63% | 60% |
| Persistence Fall to Fall | 31% | 44% | 41% | 45% | 41% |
| Unduplicated Degrees | 11 | 7 | 7 | 7 | 5 |
| Associate Degrees Awarded | 13 | 8 | 8 | 7 | 6 |
| Transfers to UH 4-yr | 2 | 10 | 12 | 6 | 7 |
| Transfers with program degree | 0 | 6 | 3 | 3 | 4 |
| Transfers without program degree | 2 | 4 | 9 | 3 | 3 |

Table 4: ARPD Distance Indicators

| Distance Indicators | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|--|---------|---------|---------|---------|---------|
| Number of Distance Education Classes Taught | 3 | 1 | 26 | 18 | 9 |
| Enrollments Distance Education Classes | 16 | 2 | 443 | 305 | 152 |
| Fill Rate | 36% | 13% | 69% | 67% | 69% |
| Successful Completion (C or Higher) | 81% | 100% | 81% | 78% | 83% |
| Withdrawals (Grade = W) | 1 | 0 | 14 | 17 | 6 |
| Persistence (Fall to Spring Not Limited to Distance Education) | 100% | 100% | 69% | 56% | 53% |

Performance Indicators (Table 5): The five-year average of ratio of Native Hawaiian to general population enrollment and degrees attained are similar, indicating a relatively small parity gap in each metric. A five-year average is considered since annual fluctuations and total numbers are small enough to defy meaningful interpretation. The percentage of Native Hawaiian students enrolled in the program is 22% (Based on a five-year average from **Table 1**, i.e. 43 NH students of 196 total). This percentage is relatively high compared to other UHCCs. Over the past five years, 17% (seven out of 42 total degrees in **Table 5**) were awarded to Native Hawaiians. For reference, about 30% of the campus student population identifies as Native Hawaiian though a smaller percent of Kauai’s population is identified as Native Hawaiian in the US Census. A one-to-one comparison between the campus and census demographic numbers is not possible. The [2022 census for Kauai County](#) does not have a “part-Hawaiian” category. Just 9% identify as “Native Hawaiian and Other Pacific Islander alone.” Another relevant category is 27% identifying as “Two or More Races.” The combined total of these categories, 36%, would surely overcount Native Hawaiian/Part Native Hawaiian used by the UH system since “Two or More Races” may include quite a few people who do not identify as Hawaiian at all.

Thus, there is one or two possible parity gaps: completion and enrollment, depending on whether the campus or the island population reference is used. Fewer Native Hawaiian students enroll in the ASNS program compared to the campus demographic but likely more Native Hawaiians than the island demographic. Of those that enroll, slightly fewer Native Hawaiian students complete the degree when compared with other demographics. This latter parity gap is relatively small, i.e. 22% enrollment leading to 17% of degrees. The action plan below discusses ways we have tried (and will try) to close the gap.

Table 5: ARPD Performance Indicators

| Performance Indicators | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|-----------------------------------|---------|---------|---------|---------|---------|
| Number of Degrees | 13 | 8 | 8 | 7 | 6 |
| Number of Degrees Native Hawaiian | 3 | 2 | 0 | 2 | 0 |

Part IV. Assessment Data (EP 5.202)

- a) Program Student Learning Outcomes
1. Analyze data effectively using currently available technology.
 2. Communicate scientific ideas and principles clearly and effectively.
 3. Analyze and apply fundamental mathematical, physical, and chemical concepts and techniques to scientific issues.
 4. Apply fundamental concepts and techniques in their chosen natural science field of study, such as biology, chemistry, engineering, physics, etc.
- b) Program Outcomes that have been assessed in the previous year

Table 6 PSLO Assessment Metrics

| PSLO Assessment | Metrics recently used |
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| 1. Analyze data effectively using currently available technology. | Assessed in PHYS 170L in fall 2022: Partially subjective evaluation of student analysis. Two labs utilizing mathematical modelling of collected data are provided to students and the students need to complete at least 1 out of 2 labs while it is highly recommended to complete both labs. The first (spring lab) follows a template, while the second (pendulum lab) is a formal write-up based on a rubric, e.g. Model sine/cosine wave using data and computer program; relate result to gravitational acceleration determined from the pendulum to that of unknown planet. An individual student meets the benchmark by scoring 80% or greater on the relevant questions (an increase from 75% in 2021-2022). This benchmark is admittedly high. |
| 2. Communicate scientific ideas and principles clearly and effectively. | Assessed in PHYS 272L: Subjective analysis of scientific writing, e.g. Rubric on detailed laboratory write up. An individual student meets the benchmark by scoring 75% or greater on the relevant questions |
| 3. Analyze and apply fundamental mathematical, physical, and chemical concepts and techniques to scientific issues. | Assessed in PHYS 170/272: Longitudinal objective assessment, e.g. assessment of improvement in student learning for 2-D vector addition problem presented in PHYS 170 compared with results in PHYS 272 |
| 4. Apply fundamental concepts and techniques in their chosen | Not Assessed. |

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| natural science field of study, such as biology, chemistry, engineering, physics, etc | Recommendation: Eliminate PSLO #4. It is superfluous because it is too similar to PSLO #3. |
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c) Assessment Results and Improvements

Table 7 PSLO Assessment Results

| PSLO Assessment | % Met Benchmark 2022 (2021 result) | Comments |
|---|------------------------------------|--|
| 1. Analyze data effectively using currently available technology. | 71.4% (N/A in fall 2021) | 4 th implementation of this assessment. The assessment was adapted to online format for fall 2021. It was kept but refined for fall 2022, as recommended in 2021-2022. Issues with data in Laulima a result of systemic errors (registration or data saving on Laulima) prevented meaningful assessment in 2021. Due to the low participation rates in the modelling labs, the curriculum was modified for the fall 2023 PHYS 170 (as well as the new PHYS 151) course. The initial 4 labs were completely changed to address issues of shipping out lab equipment to students as well as poor student performance on the initial labs. Lab #4 in particular was not well done and this was attributed to a change in modality (moving to online format). A more scaffolded approach was taken with hopes this will improve student success on PSLO #1 (and in general) for 2023. More emphasis has been put on data modelling, separating PSLO #1 from PSLO #2 (Lab #4 contained a heavy numerical modelling element as well as a heavy writing/communication element). Recommendation: Keep assessment and compare to fall 2023 data. |
| 2. Communicate scientific ideas and principles clearly and effectively. | 65% (68% in spring 2022) | As in spring 2022, all students taking the assessment met the benchmark in spring 2023. The success rate accounts for 35% of students who did not attempt this assessment as students were allowed to drop any 2 of the |

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| | | <p>lowest grade labs (or not complete to labs) and this lab occurs at the end of the term. Recommendation: Keep the assessment as is. Although the nature of the assessment was changed (mandatory to optional), the data indicates that students will not be encouraged any more so to do the assessment despite having a potentially larger consequence. In general, it was found that the students who are non-participants are those who also do not participate or fail to complete all work, thus there is not a large difference in the final grades despite the change of format. It appears that students who put in the effort will meet PSLO #2, while those who are not putting in the effort will not meet this PSLO. The conclusion can be drawn that the program is meeting the PSLO #2 for students willing to follow the curriculum.</p> |
| <p>3. Analyze and apply fundamental mathematical, physical, and chemical concepts and techniques to scientific issues.</p> | <p>50% incorrect on 1st attempt (78% incorrect on 1st attempt in spring 2022)</p> | <p>Longitudinal study: The assessment is in two parts including vector addition and angle calculation. A similar number of students fell for a distractor addressing a misconception. Students are given 2 attempts and student progress is determined by observing the % wrong responses: in 2023 the % wrong responses is given as 50% while the in spring 2022 the % wrong responses is given as 78%. This means student did better (28% better) at providing a correct answer in spring 2023 for the angle. The assessment was changed from optional to mandatory for spring 2023. Strategies were developed and implemented to address a misconception identified by the new distractor introduced for spring 2022. The increase in success rate may be attributed to a new formative assessment introduced in week 2 in spring 2023.</p> |

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| | | Recommendation: Keep existing assessment and strategies to see if improvement noted ins spring g2023 holds. |
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d) Changes that have been made as a result of the assessment results.

The value of program assessment comes from the process of carefully considering what students should learn and how to assess student learning. Assessments are still being adapted. Changes in response to program assessment are noted in the comments in Table 7 above. The most notable change is in the strategies developed to address student misconception regarding a key concept assessed in PSLO #3. Assessment plans have been continually adapted and improved as noted. PHYS 272L was identified as an ideal course to run summative program assessments since students in all ASNS concentrations must take this course and it is generally taken in their last semester at KauCC.

The Action Plan details issues of concern and strategies to address them. But these are not as a result of assessment of student learning. The total number of students in the program taking summative assessment and year-to-year changes in percent of students meeting benchmarks are too small to draw meaningful conclusions. The total number of students completing the summative assessment in PHYS 272L is reasonable; it is similar to the number of transfers to 4-yr UH institutions. Some KauCC are not assessed because not all ASNS students take PHYS 272L at KauCC before transferring within Hawai‘i or out of state. Further, some students from other UH campuses are taking only their physics courses at KauCC, which limits utility in assessing KauCC’s ASNS program.

Part V. Curriculum Revision and Review

Minimum of 20% of existing courses are to be reviewed each year so that within the timeframe of the CPR, all courses will be reviewed and revised as appropriate. Indicate when all courses within the program will be reviewed during the next five years.

| Course Prefix and Number | Date Last Reviewed | Next Review Date |
|--------------------------|--------------------|------------------|
| BIOL 171 | Spring 2020 | Spring 2025 |
| BIOL 171L | Spring 2020 | Spring 2025 |
| BIOL 172 | Spring 2020 | Spring 2025 |
| BIOL 172L | Spring 2020 | Spring 2025 |
| CHEM 161 | Spring 2019 | Spring 2024 |
| CHEM 161L | Spring 2021 | Spring 2026 |

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| CHEM 162 | Spring 2021 | Spring 2026 |
| CHEM 162L | Spring 2021 | Spring 2026 |
| EE 160 | Spring 2021 | Spring 2026 |
| EE 211 | Spring 2021 | Spring 2026 |
| EE 213 | Spring 2021 | Spring 2026 |
| EE 296 | Spring 2021 | Spring 2026 |
| ICS 111 | Spring 2022 | Spring 2027 |
| MARE 171 | Spring 2020 | Spring 2025 |
| MARE 171L | Spring 2020 | Spring 2025 |
| MARE 172 | Spring 2020 | Spring 2025 |
| MARE 172L | Spring 2020 | Spring 2025 |
| MATH 140X | Spring 2021 | Spring 2026 |
| MATH 241 | Spring 2022 | Spring 2027 |
| MATH 242 | Spring 2022 | Spring 2027 |
| MATH 243 | Spring 2022 | Spring 2027 |
| MATH 244 | Spring 2022 | Spring 2027 |
| MATH 245 (253) | Spring 2019 | Spring 2024 |
| PHYS 151 | Spring 2023 | Spring 2028 |
| PHYS 151L | Spring 2023 | Spring 2028 |
| PHYS 152 | Spring 2023 | Spring 2028 |
| PHYS 152L | Spring 2023 | Spring 2028 |
| PHYS 170 | Spring 2023 | Spring 2028 |
| PHYS 170L | Spring 2019 | Spring 2024 |
| PHYS 175 | Spring 2021 | Spring 2026 |
| PHYS 272 | Spring 2023 | Spring 2028 |
| PHYS 272L | Spring 2019 | Spring 2024 |
| SCI 170 | Spring 2021 | Spring 2026 |

Part VI. Survey Results

List results of surveys administered during the review timeframe [e.g., student satisfaction, occupational placement in jobs (for CTE programs), employer satisfaction (for CTE programs), CESSE, licensure pass rates, and graduate/leaver].

| Survey Type | Date Administered | Date of Next Survey | Results |
|----------------------------------|-------------------|---------------------|--|
| Scheduling Needs and Preferences | Spring 2022 | | 21 respondents (of 32 majors in AY21-22) 50% of students are part-time and 66% prefer to be part-time Students prefer in-person instruction (most desired modality) Students prefer 3-day/week schedule (most desired) but prefer not to have class on Fridays Most prefer class times to fall between 10am-3pm Most prefer full 16-week semesters, though the 8-week option was not far behind. The instructor and “scheduling around other courses” were tied as the most important factors in students course selection. Students primarily (overwhelmingly) use STARGPS to guide course selection. Students feel they are getting the information they need about their classes (none disagreed with the affirmative statement that the College does a good job of communicating). |

Part VII. Financials

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

| Fiscal Year | Budget |
|-------------|--------|
| AY18-19 | \$4000 |
| AY19-20 | \$4000 |
| AY20-21 | \$4000 |
| AY21-22 | \$4000 |
| AY22-23 | \$5000 |

Program or unit’s current resources.

| Category | Current Resource(s) | What is needed? | Justification |
|---------------------|---------------------|-----------------|---|
| PERSONNEL | | | |
| Positions (Faculty) | 3 | +1 additional | An additional FTE full load is covered by a lecturer in a difficult |

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| | | | area to fill (Physics and engineering); this lecturer was formally grant-funded but the grant expired in spring 2021 |
| Positions (Staff) | <0.5 | - | An office assistant serves the entire science and math division, which mostly serves the larger AA in Liberal Arts program |
| OPERATING | | | |
| Supplies | Laboratory supplies | Some expendable supplies and maintenance | Supplies are regularly used as essential components of instruction |
| Equipment | | | |
| Space/Facilities | Natural Science building, office space (shared with Science and Math division) | See request below | See request below |
| TECHNOLOGY | | | |
| Hardware | Instructor, classroom, and lab computers | Periodic maintenance or replacement | Essential components of instruction |
| Software | Software for computers | Periodic upgrades or licensing | Essential components of instruction |

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

| Action Plan | Anticipated Outcome | Actual Outcome |
|--|---------------------|---|
| Fix logistical issues preventing completion; communication with academic counselors; communication with students through new SCI 170 course; update curriculum as needed to address barriers | Completers increase | Dramatic increase in completers; Graduates increase from 2 in AY16-17 and 3 in AY17-18 to 13 AY18-19 (With a somewhat inflated boost due to reverse transfer); Completers have stayed consistently near 7 per year since then |
| Outreach to College students, outreach to local high school | Increase enrollment | Enrollment peaked in AY19-20; the pandemic |

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| <p>students, Early College math offerings</p> | | <p>dip reach nadir in AY21-22. The ASNS is the only transfer degree program at KauCC to increase its number of majors in AY22-23.</p> |
| <p>Halau Ola Honua NSF grant activities AY17-18 to AY20-21 (science specialist half-time position, student internship/research project stipends, summer math bootcamp, summer field course on Oahu)</p> | <p>Increase Native Hawaiian (NH) enrollment</p> | <p>NH Enrollment peaked in AY18-19 and reached pandemic nadir in AY20-21 and AY21-22. The percent NH enrollment relative to total enrollment in the ASNS has bounced around between 17% and 28% over the last five years. The relatively small absolute numbers defy meaningful establishment of cause and effect relations.</p> |
| <p>Academic Advising / Coordination / SCI 170 as a new required course (SCI 170 required in Fall 2020); Students develop a four-year baccalaureate plan in SCI 170 and get additional academic guidance. Correcting STAR GPS semester ordering and other issues</p> | <p>Reduce incorrect assumptions and erroneous or inefficient course planning. This is especially critical for science majors where many required courses are sequential and have rigorous prerequisites that must be taken in a specific order</p> | <p>Over 90% of students still change their academic plans based on advice in SCI 170; fewer students are in the wrong major altogether Some issues with advice provided by STAR GPS were corrected (though it remains an insufficient planning tool)</p> |
| <p>Expand Early College math offerings</p> | <p>Increase student math readiness; reduce time to completion, i.e. students ready to take MATH 241 (Calculus I), a key required math course for all three ASNS concentrations</p> | <p>Expanded Early College MATH 140, MATH 241, MATH 242 (Precalculus, Calc 1, and Calc 2) beginning AY18-19 and continuing to present has greatly reduced the demand for those courses at KauCC and contributed to increased enrollment in PHYS 170 (which requires Calc I as a pre/co requisite). For example, KauCC ran 7 non-Early College sections of those three math courses in</p> |

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| | | <p>AY18-19 but only 3 in AY23-24. Yet enrollment in PHYS 170 has increased over that time from 14 students in Fall '18 to 22 students in Fall '22 (though other factors have also boosted enrollment in PHYS 170, see below).</p> |
| <p>Coordinate with UHCC to offer physics courses for HawCC at the request of HawCC due to lack of personnel and sufficient physics enrollment</p> | <p>Increase enrollment in physics; improve fill rate</p> | <p>Annual enrollment in physics and labs for ASNS students increased from less than 30 students/year to over 80 students/year. Before the agreement, KauCC offered only the PHYS 170/272 series of lectures and labs (for physical scientists) with enrollment between 11-15 students in each course. Since the agreement, KauCC has been able to offer both PHYS 170/272 series while adding the PHYS 151/152 series and labs (for life sciences) with enrollment of 20-24 students in each course, which includes four more courses.</p> <p>The change as clearly improved fill rates for physics courses</p> |
| <p>Offer MATH 253 instead of MATH 243 and MATH 244 (Calc 3 and Calc 4); MATH 253 is an accelerated course covering the content of Calc 3 and Calc 4 in one semester; Acceptance is articulated with UH Manoa and specifically accepted by the College of Engineering at UH Manoa</p> | <p>Improve fill rate</p> | <p>Modest improvement in fill rate by reducing one chronically low-enrolled course (MATH 244) that had typically run because it is essential to completion for ASNS Engineering majors</p> |

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| Effort and innovation on program assessment involving key faculty | Identify key courses and assessments; continually revise assessment based on assessment data | Refined assessment strategy and achieved stability with assessments that can reliably be used to gain information useful for making impactful changes; attempted to measure impacts of changes and identify reasons for results (whether spurious or meaningful) – see assessment discussion |
| Create new concentration in Environmental Science in consultation with ASNS coordinators at other UHCCs and target bachelor degree programs at UH Manoa, UH Hilo | New concentration approved for Fall 2021; Increase enrollment; in increase percentage of Native Hawaiian students; increase completers and transfers, especially NH completers and transfers | New concentration approved at campus level but repeatedly blocked from implementation by UH system pending reassessment of ASNS system-wide concentration alignment (a system working group has been formed in AY23-24) |

Part IX. Analysis of Program

| Goal | Strategic Goal/Priority (List number)* | Benchmark | Desired Outcome | Unit of Measure | Year(s) Implemented |
|---|--|--------------------------------------|------------------------|------------------------|----------------------------|
| Expand outreach to university programs and local high schools | Imperative 2: Educate more students Imperative 3: Eliminate workforce needs | Enrollment of majors (38) in AY22-23 | Increased enrollment | Number enrolled | Ongoing |
| Continue to identify and address barriers to completion | Imperative 2: Educate more students Imperative 3: Eliminate workforce needs | Unduplicated degrees (6) in AY22-23 | Increased completers | Number completing | Ongoing |

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|--|---|--|---|---|--------------------|
| Expand collaboration with academic counselors and university programs | Imperative 2: Educate more students Imperative 3: Eliminate workforce needs | Transfer to UH universities (7) in AY22-23 | Increased transfers to UH universities | Number transferring | Ongoing |
| Refine and implement a new ASNS Environmental Science concentration | Imperative 1: Ensure that UH supports the success of Native Hawaiians in learning, teaching, service and research Imperative 2: Educate more students Imperative 3: Eliminate workforce needs | New Environmental Science concentration implemented | New Environmental Science concentration implemented | New Environmental Science concentration implemented | AY24-25 or AY25-26 |
| Continue meaningful use of PSLO assessment | Imperative 2: Educate more students, empowering them to achieve their goals and contribute to civil society | Existing PSLO assessment plan | Plan changes or other actions developed and implemented | Well-justified data-driven changes | Ongoing/continual |
| Ensure Engineering students have access of key lower-division engineering courses such as EE 160 | Imperative 2: Educate more students Imperative 3: Eliminate workforce needs | EE 160 or ICS 111 offered at least once every other year | EE 160 or ICS 111 offered at least once every year; Offer or provide access in the UH system to other key | Number of key courses offered per year; number of students served | Ongoing |

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| | | | lower-division engineering courses not currently offered at KauCC | | |
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*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).

One (1) FTE Physics instructional position. This position was on track to be institutionalized from an expiring grant-funded position, but the COVID-19 hiring freeze meant that this plan was not implemented. The need for an additional physical science instructor remains the same if not greater. The current lecturer regularly carries a near-full load (23 TEs vs 27 TES for a full load). An instructor with the right qualifications could easily achieve or surpass a full load with Early College, general education, or CTE courses in Electronics Technology. A judicious hire might also be able to fulfill our ongoing need to secure a qualified, long-term instructor for computer programming (EE 160 or ICS 111) or other key engineering courses required for engineering majors. **COST: salary and fringe benefits for one instructor. DATE NEEDED: Fall 2024.**

Replace cabinets and shelving in NSCI 107 and 101: Health and Safety concern. The fixtures in these two rooms have reached their end of life and will need to be replaced soon. Several of the cabinets are falling apart and some of the counterspace has holes in it. Recently installed electrical outlets are no longer firmly attached to the lab stations because the integrity of the material has been compromised. This minor renovation will alleviate the safety issues posed by the existing cabinets. (This is also being requested by the ASNS program.) **COST: \$8000-\$12,000, per room per estimate by Pat Watase for similar work performed last year in another classroom.**

Further Resources are Requested to Renovate the NSCI 107 Classroom: Health and Safety concern. Legacy gas lines used to feed Bunsen burners are obsolete and a potential hazard. Central consoles for gas burners and sinks along each row restrict instructional flexibility and are superfluous. These can be removed along with the gas lines and the classroom refurbished. An updated estimate may be needed. Estimates of sink and gas line removal and renovation will depend greatly on details, e.g., which current building codes are relevant, whether engineering drawing or emergency shut-off valves are needed, etc. **COST: \$50,000-\$100,000.**

Student Laptops (Replacement) Students use classroom laptops to collect, record, analyze, and print data. The current laptops are over five years old, with only a subset still working. Up to sixteen new student laptops are requested. **COST: \$16,000.**

Science Building for the 21st Century: The biology, chemistry, and physics classrooms (Natural Science Building) are in an embarrassing, decrepit state that reflects poorly on the

college and our science program. They also present a health hazard. What we really want is capital improvement funds and/or UH Foundations funding for a new, modern science building that is efficient and constructed with sustainability in mind. **COST: \$20,000,000 (UHMC's Science Building completed and LEED certified in 2013 for \$40,000,000. The building at UHMC is substantially larger than needed at Kaua'i CC but inflation means costs have grown).**