AUTHORIZATION TO PLAN AN ACADEMIC PROGRAM

1. School/College and Department/Unit:
Hawaii Community College· Liberal Arts· Math & Natural Sciences (MNS)

2. Chair/Convener of Planning Committee: Laura Brezinsky, Ph. D. Associate Professor, Biology, & Science Co-Chair Hawaii Community College
Guy Kimura, Interim Dean, Liberal Arts and Public Services, Hawaii Community College

3. Program Category:
New

4. Level of Program or Major
Undergraduate

5. Degree or Certificate Proposed:
Associate in Science in Natural Science degree (A. S.).

6. Planning
a. Planning Period-Spring 2012-Fall 2013
b. Activities- During the planning period the Math and Natural Science Division-Science co-chair will convene the new A. S. degree planning committee consisting of Science, Technology, Engineering and Mathematics (STEM) faculty, counselors, and administrators, to develop the proposed degree requirements.
c. Date of Implementation-HawCC will submit the new A.S. degree Authorization to Plan to the Board of Regents (BOR) for approval, with an effective of Spring 2014.
d. Planning Workload/Budget-Funding for the initial planning period will utilize existing staff and resources.

7. Program Description
The new Associate in Science degree is designed for students planning to transfer to a science, technology, engineering or math (STEM) baccalaureate degree program in Hawaii or the continental United States. The proposed degree will provide focused advising and appropriate course sequencing for successful transfer of our students. The proposed curriculum will require a minimum of 60 credits of 100-200 level courses and a 2.0 grade point average (GPA) minimum for all courses required by the degree. This includes 18 credits of General Education (GE) Core; 9 credits of Humanities, 12 credits of Social Sciences (GE area requirement); 18 credits of GE Area requirements; and a minimum of 19 credits in Science, Technology, Engineering and Math (STEM), 10 of which will satisfy the Natural Sciences area requirements for GE. Two writing intensive courses will be required as well as one course in Hawaiian, Asian or Pacific issues. Students who complete this A. S. degree with a STEM focus will have met the University of Hawaii GE requirements for a baccalaureate degree as outlined in E5.209, University of Hawaii System Student Transfer and Inter-Campus Articulation. Students with this
A. S. degree will also have met the University of Hawaii at Hilo’s General Education and Integrative requirements.

The degree will provide a focus for the College to identify, recruit, counsel and ensure degree completion of STEM students. The proposed degree will facilitate articulation and transfer agreements between Hawaii Community College (HawCC) and four-year STEM programs at UH Manoa (UHM) and UH Hilo (UHH) and UH West Oahu (UHWO).

Collaboration with UHH will be the main focus of this HawCC degree because: (1) most of HawCC’s students who transfer into upper division programs, enroll at UHH; (2) current HawCC student demographics (i.e., interest in STEM, student preparedness for STEM, etc.) would require the college to emphasize student preparation through appropriate recruitment, counseling, advising, etc. as mentioned above; (3) HawCC does not have adequate laboratory facilities to support specialized STEM course offerings at the 200 level; (4) Initially, HawCC may not be able to fill some of the required classes; and (5) of close proximity between HawCC and UHH, concurrent enrollment at HawCC and UHH will be the primary means to ensure student completion and transfer; and (6) the necessary supplemental faculty and laboratories will be available through UHH.
## Timeline and Implementation Tasks:

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<th>Timeline</th>
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<tr>
<td><strong>Spring 2012</strong></td>
<td>The MNS-Science co-chair will convene the new A. S. degree planning committee consisting of Science, Technology, Engineering and Mathematics (STEM) faculty, counselors, and administrators, to develop the proposed degree requirements.</td>
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<td><strong>Spring 2012</strong></td>
<td>STEM faculty will develop and disseminate information, linked to this document, to campus constituents to substantiate the need for the A. S. Degree and outline additional courses, curricular pathway emphases and degree changes that will be required. The Dean for Liberal Arts and Public Services will work with the Vice Chancellor for Student Affairs to assign one Counselor to be available to advise STEM majors. The ATP will be presented to the Faculty Senate Curriculum Review Committee for approval. From there, the ATP will be submitted to the CCAO’s and then to the BOR for their approval.</td>
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<td><strong>Spring 2012-</strong></td>
<td>The HawCC VCAA will collaborate with UHH to revise or develop a concurrent enrollment policy, articulation and procedures for these HawCC STEM students.</td>
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<td><strong>Fall 2012</strong></td>
<td>Participating STEM faculty will complete revisions of existing courses and begin to create new courses to support the proposed degree, and submit them to the HawCC Academic Senate’s Curriculum Review Committee.</td>
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<td><strong>Fall 2012-</strong></td>
<td>The planning committee will complete a review of the existing physical and faculty resources, and make recommendations.</td>
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<td><strong>Spring 2013</strong></td>
<td>HawCC will establish STEM transfer and articulation agreements with UH Hilo. Student advising sheets will be developed for life science, environmental science and physical science concentrations.</td>
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<td><strong>Fall 2013-</strong></td>
<td>Upon approval, new and revised courses will be taught at HawCC. BOR approval will be sought for new degree.</td>
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<tr>
<td><strong>Spring 2014</strong></td>
<td>The proposed degree program will be implemented and published in the HawCC Catalog.</td>
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8. Program Justification

The absence of a Natural Science A. S. degree impacts the growth of coherent, strong and diverse STEM offerings and the success of our students in STEM. While 1,629 were enrolled in STEM major courses (100 level and above, and excluding Nursing majors) in AY 2010-2011 (as per Shawn Flood, HawCC Institutional Analyst), presently, most of them can only declare themselves “liberal arts” majors. The ability to identify STEM majors early in their academic journeys will allow the College to meet their needs more effectively and to engage them in STEM-related activities as soon as their first semester. The establishment of a clearly defined STEM degree pathway will help to leverage additional funding for this program.

The A. S. Natural Science degree supports the HawCC 2008-2015 strategic plan specifically: “increase by 6% per year degrees/certificates awarded in Science, Technology, Engineering, and Math (STEM) fields;” (Strategic Outcomes B.3), and the UHH 2008-2015 Strategic Plan “Globally Competitive Workforce-to address workforce shortages and prepare students for effective engagement and leadership in a global environment [by increasing] UH degrees in STEM fields. The Natural Science A. S. degree focus in STEM also supports other HawCC Strategic Plan Action Strategies that provide all students with a first-year experience, which includes the exploration of STEM.

We anticipate that the proposed degree will reinforce and deepen STEM learning across the curriculum, strengthen the STEM infrastructure of the College, and allow HawCC to generate a reliable stream of successful STEM students who will transition into 4 year programs and beyond. Early introduction of STEM-oriented, 2nd year courses would allow students the opportunity to experience their chosen discipline beyond the survey course level to determine if it is the right educational direction for them. In addition, the A.S. Natural Science degree supports three of the six broad planning themes in HawCC’s draft Academic Master Plan: 2010-2015. The three planning themes that have been documented by specific best practices in the national postsecondary literature are STEM, Student Completion/graduation and Student Transfer.

The A.S. in Nursing program at HawCC has a large wait list of students seeking admission to a limited number of spaces available each year. With the addition of the A.S. in Natural Science degree, students seeking a career in a STEM field besides nursing would have another academic alternative including the possibility, upon graduation, of transferring into a baccalaureate STEM field.

Second year STEM opportunities provided by NSF, USDA, and NASA supplemental grants (among others) will allow students to participate in research traineeships, which further expose students to STEM. These grants are focused on funding for all students (including those in underrepresented groups) who pursue STEM majors and successfully complete this A. S. Degree and transfer to baccalaureate institutions.

An Internet survey revealed that the proposed degree is offered at other community colleges throughout the United States:

   Community College of Vermont (Environmental Science)
   Edmonds Community College, Lynnwood, Washington (Environmental Science)
Tacoma Community College, Tacoma Washington (Environmental Science)
Columbus State Community College, Columbus, OH, (Environmental Science, Safety and Health Associate degree)
Lane Community College, Eugene, OR (Earth and Environmental Science)
Massachusetts Bay Community College (Environmental Science and Safety)
Barstow Community College, Barstow California (Natural Science)

In the UH System, Associate in Science degrees have typically been two-year programs in the career and technical education fields, however nothing in the current UH Board or executive policies precludes an associate in science transfer degree, i.e. an associate degree in science. Executive Policies E5.201 (Section E.1.), E 5.203 (Section III.1.a) and E5.205 all list an associate as a type of degree, along with bachelor, master and doctorate. No further distinction is made for associate degrees. In E5.209 (Section III, B. 2), the articulation and transfer policy refers specifically to an articulated A. A. degree. The policy states that “A UH Associate in Arts degree (AA) degree is accepted as fulfilling lower division general education core (basic/area or foundations/diversification) requirements at all UH baccalaureate degree-granting institutions and specifies the criteria by which the A. A. can be considered an “articulated A. A.” E5.209 does not, however, preclude associate in science degrees from articulation.

The definition of an associate in science degree is found in Chancellor for Community Colleges’ Memo 6004 (p. 2-3):

“Associate in Science (A. S.) degree: A two-year technical-occupational-professional degree, consisting of at least 60 semester credits, which provides students with skills and competencies for gainful employment, entirely at the baccalaureate level. The issuance of an A. S. degree requires that the student must earn a GPA of 2.0 or better for all courses applicable toward the degree.”

Since the formulation of that definition, a number of circumstances have changed. Increasingly, two-year degrees are considered as pathways to careers, even if transfer degrees are now so framed. In addition, a number of existing UHCC A. S. degrees are now or will soon be transfer degrees to baccalaureate programs, both within and outside the UH System. In the UH system, the Early Childhood Education A. S. degree will now transfer to UH West Oahu, as does the KapCC Respiratory Care A. S. degree. The KapCC A. S. in Hospitality transfers to the UH Manoa Travel Industry Management program and the Accounting and IT A.S. degrees transfer to Hawaii Pacific University.

9. Description of Resources Required and Status of Sources

a. Faculty:
HawCC has 14 full-time STEM faculty and 4 have of them have Ph. Ds from UHM, one of 2 main transfer destinations for our students. Science and Math faculty have developed highly collaborative relationships among themselves and other faculty on the campus as a result of their participation in the Great Teachers Seminars, Wo Learning Champions and involvement in the development of learning communities.
b. **Physical Resources:**
The college has 1 Biological and 1 Physical Science Lab facility, but both facilities are limited. There are no immediate plans to build any new structures. This issue will be reviewed during the planning process for this program.

c. **Additional Resources Required:** As mentioned, the college only has 1 Biology Lab and 1 Physical Science Lab. The Biology Lab is quite small and is currently being scheduled to capacity. There are no building plans in place that would increase/improve our existing STEM facilities. Therefore, we will be working with UHH to create a working agreement that will allow the A.S. in Natural Science/HawCC students to enroll in specific classes at UHH thus enabling participants to complete their course requirements. As this program grows we will be requesting additional facilities that will allow HawCC to provide all of the required courses that will be included in this new degree program. Preliminary meetings with UHH have been positive and we have every indication that we will be able to come to a common agreement.

d. **Estimate of Additional Position Counts and Budget Implementation (5 years):**
STEM faculty are already employed by the college. However, with the anticipated growth due to student interest in this program, it is estimated that HawCC will require one new 11 month STEM coordinator (FTE faculty) to collaborate with STEM faculty to identify, recruit, retain, advise and track STEM students. One full time clerical staff will also be required to support this program. This issue will also be reviewed during the planning for this program.

Additional required resources will ensure that there are adequate counseling/advising resources; and faculty/lecturers to teach additional courses that will be added to the catalog.
10. Five-year business plan

Associate in Science Degree in Natural Science
Calculation of Cost/Revenues and Cost/Student Semester Hours

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<tr>
<td><strong>Student Semester Hours (SSH):</strong></td>
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<tr>
<td>Headcount¹</td>
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<tr>
<td>Annual SSH²</td>
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<td><strong>Costs:</strong></td>
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<td>Cost of Instruction³</td>
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<td>Support Costs⁴</td>
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<td>Unique Program Costs⁵</td>
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<td><strong>Total Costs</strong></td>
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<td><strong>Cost/SSH</strong></td>
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<td>Tuition⁶</td>
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<td>General Funds⁷</td>
<td>$75,744</td>
<td>$78,016</td>
<td>$80,357</td>
<td>$82,768</td>
<td>$85,251</td>
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¹ Headcount Based upon anticipated number of majors
² Annual SSH Based upon majors taking 30 credits per year
³ Cost of Instruction Based upon one full-time faculty at a Rank of C2 with a minimum salary or $50,004 in the 2013-2014 year with an estimated 3% increase each year. Includes 40.25% fringe rate. Full-time faculty workload is considered to be 27 credits per year, so included in the cost of instruction is a one Step A lecturer at $1,334 per credit for 3 credits plus 40.25% fringe. Subsequent lecture rates are estimated to increase by 3% per year similar to estimated faculty increases.

C2 2013-2014 minimum = $50,004 + $20,127 (fringe) = $70,131
Step A lecturer 2013-2014 at $1,334 per credit = $4,002 (3 credits) + $1,611 (fringe) = $5,613

C2 2014-2015 minimum = $51,504 + $20,731 (fringe) = $72,235
Step A lecturer 2014-2015 at $1,374 per credit = $4,122 (3 credits) + $1,659 (fringe) = $5,781

⁴ Support Costs Based upon estimated expenditures per SSH for STEM programs and student support services of $325 per SSH from instruction and student affairs.
⁵ Unique Program Costs Costs specific to the program for equipment, supplies etc. and based upon approximate total allocations to each STEM program with an estimated 3% increase per year.
⁶ Tuition Based upon annual resident per credit tuition rate schedule through the 2016-2017 year and an estimated 5% increase for the 2017-2018 year.
⁷ General Funds Based upon historical general fund allocations form salary plus fringe benefits.

11. Budget:
Initially, we do not expect to attract students who would not otherwise be attending HawCC, nor will we be offering any new courses. In subsequent semesters, we expect to offer new STEM
courses, which will impact operational budgets. As the program grows, the College will need additional support faculty and staff. Positions will be requested in the 14-15 biennium budget.

12. Impact on Current Courses or Programs.
The proposed degree will have little or no impact on the A.A. degree transfer degree currently offered at the college. The majority of pre-STEM students may now forgo the A.A. degree and elect to transfer without attaining a 2-year degree. However, a positive impact of this A.S. in Natural Science program will be to build student interest in STEM careers by offering a two-year degree that can be completed at the College as well as providing for an articulated A.S. degree that would transfer into and lead to a STEM baccalaureate degree. With the possibility of transferring to the baccalaureate level, students would also increase their ability to obtain a graduate STEM degree.

This A.S. in Natural Science supports specific STEM-related outcomes and performances measures in the UH, UHCC and HawCC strategic plans. In addition, the A.S. in Natural Science directly supports one of the 5 major goals in the plans, Functioning as a Seamless State System, by providing an articulated transfer degree option for students besides the A.A. degree. As mentioned previously, the A.S. in Natural Science also directly supports three of the six broad planning themes in HawCC’s draft Academic Master Plan: 2010-2015.

HawCC’s nursing program would be positively impacted because students on the wait list, waiting for admission to nursing, would have another option of pursuing an A.S. degree in a STEM field.

13. If this program is multidisciplinary, provide evidence of commitment for support for colleges, departments, programs and/or individuals expected to participate.
N/A
**Reviewed by:** (The ATP has completed the campus approval process prior to review by Council of Chief Academic Officers)

**Campus Chief Academic Officer:**
Comments and Recommendations:

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Council of Chief Academic Officers (System-wide Consultation):
Comments/recommendations

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Chancellor: ___Approved  ___Disapproved

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(Final signed copy is provided to the Vice President of Academic Planning and Policy for Program Action Report)