Honolulu Community College
Associate in Science (A.S.) in Natural Science (N.S.) with a Concentration in
Environmental Science

AUTHORIZATION TO PLAN AN ACADEMIC PROGRAM

1. School/College and Department/Unit:
Honolulu Community College • University College • Math & Natural Sciences

2. Chair/Convener of Planning Committee:
Greg Witteman, Ph.D. Lecturer, Biology, Honolulu Community College
Erika Lacro, Vice Chancellor for Academic Affairs, Honolulu 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.) with a concentration in Environmental Science.

6. Planning
b. Activities – During the planning period the Chair will convene the new A.S degree Committee consisting of Science, Technology, Engineering and Mathematics (STEM) curricular pathway coordinators, Math and Science (M/S) Department Chair, Arts & Sciences counselors and other academic specialists to develop the proposed degree requirements and align existing course offerings at Honolulu Community College (HonCC) with the new degree. Faculty will make suggestions of new course offerings that will support the degree.
c. Date of Implementation – HonCC will submit the new A.S. degree to the Board of Regents for approval in Fall 2012, with an effective date of Fall 2013.
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 mathematics baccalaureate degree program at a four-year institution in Hawai‘i or on the U.S. mainland. The proposed degree will provide focused advising and appropriate course sequencing for efficient transfer of our STEM students. The proposed curriculum will require a minimum of 60 credits of 100- and 200- level courses; and a 2.0 grade point ratio (GPR) minimum for all courses required by the degree. This includes 12 credits of Foundation requirements; 9 credits of Diversification requirements; and a minimum of 19 credits in STEM. Two writing intensive courses will be required as well as one course in Hawaiian,
Asian, and Pacific Issues. Students who complete this A.S. degree with a STEM focus will not have met general education requirements for a baccalaureate degree as outlined in E5.209. They will be missing three credits in the each of two diversification areas (Arts & Humanities and Social Sciences).

The degree will provide a focus for the College to identify, recruit, counsel and retain STEM students. The degree will be the endpoint for students who move through curricular pathways that include undergraduate research opportunities that draw on the College’s strengths in faculty and resources. The proposed degree will facilitate articulation and transfer agreements between HonCC and four-year STEM programs at UH Manoa (UHM) and UH Hilo (UHH) and UH West Oahu (UHWO).

**Timeline and Implementation Tasks:**

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<tr>
<th>Timeline</th>
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<tr>
<td>Summer 11 - Fall 11</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 of Arts and Sciences will assign one Counselor to be available to advise STEM majors.</td>
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<tr>
<td>Fall 11 - Spring 12</td>
<td>Participating STEM faculty will complete revisions of existing courses and begin to create new courses to support the proposed degree and begin to submit them to the College’s Curriculum Committee. STEM faculty will develop plans for a new STEM center to focus all activities related to the A.S. Degree. A STEM Outreach Coordinator will be hired to support activities related to the new degree.</td>
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<td>Fall 11 - Spring 12</td>
<td>STEM Faculty and the Vice-Chancellor for Academic Affairs will establish STEM transfer and articulation agreements with UH Manoa, UH Hilo, and other Hawaii and mainland universities. Student advising sheets will be developed for life science and physical science concentrations.</td>
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<tr>
<td>Fall 12</td>
<td>Upon approval, new and revised courses will be taught at HonCC. Board of Regents approval will be sought for new degree.</td>
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<tr>
<td>Fall 13</td>
<td>The proposed degree program will be implemented and published in the Fall 13 HonCC Catalog.</td>
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8. Program Justification
The absence of a STEM A.S. degree impacts the growth of coherent, strong and diverse STEM offerings and the success of our students in STEM. While more than 2,500 students were enrolled in STEM major courses (note - some students may be enrolled in more than one STEM course) in AY 2010-2011, presently they 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. These majors are part of a pool of students from which the College can recruit paid student positions to support all STEM majors and dramatically increase the number and quality of STEM graduates.

We anticipate that the proposed degree will reinforce and deepen STEM learning across the curriculum, support and strengthen the STEM infrastructure of the College, and allow HonCC to become a salient incubator of science talent. By enhancing the STEM curriculum and offering a focused degree program, more of the College’s students will pursue STEM majors and successfully complete their degrees.

Currently, students pursuing the A.A. degree are required to fulfill all general education requirements and, as a result, cannot take the STEM courses that they need early enough in their education. Early introduction of STEM-oriented, 2nd year courses allows students the opportunity to experience their chosen discipline beyond the survey course level to determine if it is the correct educational direction for them and if they have the talent and skills needed to succeed in STEM. Further, upon transfer with the current A.A. degree, STEM students have only major courses to take in their 3rd and 4th years, making their fulltime schedule of courses unmanageable in these years. The structure of the proposed degree will spread out the general education requirements through four years, increasing retention rates and decreasing dropped classes.

Second year STEM opportunities provided by NSF, USDA and NASA supplemental grants will allow students to participate in research traineeships, which further exposes students to STEM. These grants are focused on funding for Hawaiian students and other underrepresented groups who pursue STEM majors and successfully complete this A.S. degree and transfer to baccalaureate institutions.

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

- Community College of Vermont (Environmental Science)
- Edmonds Community College, Lynnwood, Washington (Environmental Science)
- Columbus State Community College, Columbus, Ohio, (Environmental Science, Safety and Health Associate Degree)
- Lane Community College
- Massachusetts Bay Community College (Environmental Science and Safety)
- Tacoma Community College
While it is true that heretofore in the University of Hawai‘i system, associate in science degrees have typically been two-year programs in the career and technical education fields, nothing in current Board or executive policies precludes an associate in science transfer degree. i.e. an associate’s degree in science. Board of Regents policy 5-1a (1) (4) lists the associate as a kind of degree. Similarly, Executive Policies E5.201-E-1, E5.203 and E5.205 all list an associate as a kind of degree, along with bachelor’s, master’s and doctorates. No further distinction is made for associate degrees. In E5.209, the articulation and transfer policy refers specifically to an articulated AA degree. The policy “clarifies that the AA degree satisfies Gen Ed requirements and admission to UH baccalaureate campuses” and specifies the criteria by which the AA can be considered an “articulated AA.” E5.209 does not, however, preclude associate in science degrees from transferring.

The definition of an associate in science degree is found only in Chancellor for Community Colleges’ Memo 6004:

“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 skills and competencies should be in conformance with the recommendations listed in the "Report of the Associate in Science (AS) Degree Task Force" (see Appendix 2). 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 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. The Early Childhood Education degree will now transfer to UH West O‘ahu, as does the Respiratory Care A.S. degree and as the Culinary A.S. degree soon will. The A.S. in Hospitality transfers to the UHM Travel Industry Management program. The Accounting and IT A.S. degrees transfer to Hawai‘i Pacific University. Given these changes in circumstances, it would suggest that a review of the basic definitions may be in order.

9. Description of Resources Required and Status of Sources

a. Faculty: HonCC has 18 full-time STEM faculty and 21 part-time faculty; six of 18 full-time Math/Science Faculty have Ph.Ds; nine of the 19 have their degrees from UHM, the main transfer destination of 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 learning communities.

b. Library Resources: The library has a fully developed oceanography and aquaculture resources. During the planning process for this program we will review the need for additional library resources.
c. **Physical Resources:** The College has plans for a new Science Building with space for a STEM center that will focus STEM activities on the 1st floor. The College's STEM course offerings (shown below, data from Fall 2010, small class sizes and large number of students provide a strong base upon which to build an effective A.S. degree program.

STEM and Related Facilities and Labs: Teaching Laboratories: The College has five STEM 1st and 2nd year teaching laboratories designed to accommodate 22 students each. Laboratories are currently shared by both STEM majors’ courses and by science laboratory courses for non-science majors. All of the laboratories have Internet access and digital projection capabilities.

d. **Additional Resources Required:**
In the Associate in Arts (Liberal Arts) program review has identified the need for a new APT STEM Outreach Coordinator who assists STEM faculty in identifying, recruiting, retaining and tracking STEM students.

e. **Estimate of Additional Position Counts and Budget Implementation (5 yrs):**
The STEM-related faculty are already employed by the College. The resources needed will be to ensure there are adequate counseling resources and communication links between HonCC and other 4-year institutions.

10. **Five-year business plan**

**Associate in Science Degree with a concentration in Environmental Science**

**Calculation of Cost/Revenues and Cost/SSH**

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<tr>
<td>Student Semester Hours (SSH)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Headcount¹</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
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<tr>
<td>Annual SSH²</td>
<td>750</td>
<td>780</td>
<td>810</td>
<td>840</td>
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<td>Costs:</td>
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<tr>
<td>Cost of Instruction³</td>
<td>$96,750</td>
<td>$98,685</td>
<td>$100,659</td>
<td>$102,672</td>
<td>$104,725</td>
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<tr>
<td>Support</td>
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<td>$178,245</td>
<td>$181,810</td>
<td>$185,446</td>
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¹ Anticipated number of majors
² Number of semester hours taken by majors per year, based on students taking approximately 30 credits of AS degree courses per year.
³ Direct payroll costs for all personnel teaching the program. Calculations are particularly challenging since the courses are offered to a much broader audience than just the A.S. majors. For instance, 2,557 students were enrolled in all the math, science, technology and engineering classes in AY 2010-2011. Projected costs are based on cost per SSH for Natural Science (MAPS Report, Expenditures Study 2009-2010, latest available data). The cost per SSH in 2009-2010 was computed at $129. The cost in subsequent years has been adjusted to reflect UHPA collective bargaining raises (03-04 = $95, 04-05 = $97, 05-06 = $100, 06-07 = $105, 07-08 = $115, 08-09 = $128, 09-10 = $130, 10-11 = $133, 10-11 = $135). Salaries have been projected with a 2% increase in the years beyond the current UHPA agreement.
<table>
<thead>
<tr>
<th>Costs(^4)</th>
<th>$84,710</th>
<th>$86,404</th>
<th>$88,132</th>
<th>$89,895</th>
<th>$91,693</th>
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<tbody>
<tr>
<td>Unique Program Costs(^5)</td>
<td>$356,210</td>
<td>$363,334</td>
<td>$370,601</td>
<td>$378,013</td>
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<tr>
<td>Cost/SSH</td>
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<td>$458</td>
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<td>Revenues:</td>
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<tr>
<td>Tuition(^6)</td>
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<td>General Funds(^7)</td>
<td>$559,512</td>
<td>$570,702</td>
<td>$582,116</td>
<td>$593,758</td>
<td>$605,633</td>
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11. Budget

It is anticipated that this new degree will be introduced to HonCC students in Fall 2012. Initially, we do not expect to attract students who would not otherwise be attending HCC, nor will we be offering any additional courses. In subsequent semesters, we expect to offer new STEM courses, which will alternate with existing courses, thereby minimizing any impact on operational budgets. However, as recruitment efforts target new students, 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 forgo the A.A. degree and elect to transfer without attaining a 2-year degree.

13. If this program is multidisciplinary, provide evidence of commitment for support for colleges, departments, programs and/or individuals expected to participate.

N/A

\(^4\) Expenditures per SSH for operations, student support, etc. HCC = $233/SSH (MAPS Report, Expenditures Study 2009-2010, the latest available data).
\(^5\) Costs specific to the program for equipment, supplies, etc.
\(^6\) SSH for courses taught by program faculty x tuition rate/credit. Last available rate, 2011-2012 = $97/credit.
\(^7\) General Funds include the State’s portion of the UHPA collective bargaining agreement. A 2% increase is projected for the years beyond the current UHPA agreement.
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:

__________________________________________  ____________________________  __________
Print Name                                     Signature                                    Date

Council of Chief Academic Officers (Systemwide Consultation):
Comments/Recommendations:

__________________________________________  ____________________________  __________
Print Name                                     Signature                                    Date

Chancellor: ___ Approved   ___  Disapproved

__________________________________________  ____________________________  __________
Print Name                                     Signature                                    Date

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