Authorization to Plan (ATP) a New Academic Program
Associate of Science (A.S.) in Plant Biology and Tropical Agriculture
Division of Science and Mathematics

1. Consultation with the Vice Chancellor for Academic Affairs (VCAA) regarding the interest in proposing a new degree/certificate

The Agriculture faculty at Kauai Community College have had several meetings with Kauai Community College VCAA James Dire, regarding the need for expansion of the Kauai Community College agriculture program to include additional certificates and a transfer-level associate's degree in Plant Biology and Tropical Agriculture. Kauai Community College VCAA James Dire is also on the program planning committee. In addition, the VCAA's from both Leeward and Kauai Community Colleges, Mike Pecsok and James Dire, have met to discuss a joint-campus AS proposal in Plant Biology and Tropical Agriculture.

2. Identify the campus, school/college and department/division requesting the ATP

Kauai Community College, Division of Science and Mathematics, Plant Biology and Tropical Agriculture program

3. List the planning committee chair and members

- Sharadchandra Marahatta, Instructor of Integrated Farming, Co-chair
- Adrienne Kleintop, Instructor of Agronomy, Co-chair
- Brian Yamamoto, Science and Mathematics Division Chair, Professor of Biology
- James Dire, Vice Chancellor of Academic Affairs

4. Identify the degree/certificate proposed

Associate of Science (A.S.) in Plant Biology and Tropical Agriculture

a. Certificate of Achievement (C.A.) in Plant Biology and Tropical Agriculture
b. Certificate of Completion (C.C.) in Plant Biology and Tropical Agriculture

5. Description of the need for program:

a. Program Description:

The A.S. degree in Plant Biology and Tropical Agriculture is designed to meet the needs of students interested in agriculture. The A.S. in Plant Biology and Tropical Agriculture is designed as a transfer-level degree to provide a pathway for students wishing to transfer to four-year degree programs at UH Manoa, UH Hilo, or other institutions. The A.S. in Plant Biology and Tropical Agriculture may also be utilized as a terminal degree for students wishing to enter the workforce directly. Graduates with an A.S. degree in Plant Biology and Tropical Agriculture will qualify for a range of different agricultural occupations that provide improved career opportunities and income.

Kauai Community College is also located in an ideal location conducive to agriculture, and opportunities exist for forming partnerships between the Plant Biology and Tropical Agriculture program and agricultural stakeholders on Kauai. Four out of the five major agricultural seed companies are located on

Kauai, along with the largest coffee farm in the U.S., the National Tropical Botanical Garden headquarters, and multiple smaller diversified agriculture operations. There is a high demand for skilled agriculture employees to meet the employment needs of agriculture stakeholders on Kauai, and this program is designed to produce agriculture graduates to meet this demand

1) *List the program learning outcomes*
   - Demonstrate an understanding of scientific and agricultural terminology and be able to communicate in different settings and with different audiences using appropriate terminology.
   - Understand and apply the scientific method through identification and research of an agricultural problem or question, forming a hypothesis, performing experiments, and analyzing and interpreting the results.
   - Understand the concepts, principles, techniques, and applications of tropical horticulture, plant biology, and soil science along with underlying concepts from chemistry, biology, and mathematics.
   - Identify and analyze the biotic and abiotic factors which affect plant production and management techniques to address these factors on the local, national, and global level.
   - Gain practical hands-on learning experiences in plant biology and tropical agriculture involving both field and laboratory investigations.

2) *Justify the program (include, as appropriate, evidence of internal and external factors driving need for this program; completion of needs assessment; number of interested students per year; need for such a program in relation to workforce development, graduate studies, etc.)*

   An A.S. program in Plant Biology and Tropical Agriculture is needed on Kauai in order to meet the needs of Kauai agricultural stakeholders and also to provide students with access to higher wage careers or further academic pursuit of a B.S degree. Kauai Community College currently has an academic subject certificate in Plant Biology and Tropical Agriculture, and enrollment in the certificate program is approximately 16 students. Enrollment in the certificate program is largely represented by current agricultural employees seeking to gain additional knowledge, skills, and credentials. Discussions with agricultural employers have identified the need for a more skilled labor force with a minimum A.S. level of technical and scientific training, or even more ideally with a B.S. degree. However, currently there is a lack of locally available individuals with technical and scientific training to meet the needs of major agricultural employers on Kauai.

   Table 1 shows the agriculture related national employment outlook for community college graduates with a certificate or associates degree. A diverse range of agriculture-related employment opportunities exist for certificate or A.S. degree graduates including agricultural and food science technicians, precision agriculture technicians, agricultural inspectors, greenhouse and nursery managers, first-line supervisors of workers, and purchasing agents. The job mobility and national median yearly income for community college graduates far exceeds that of workers without any post-secondary education (Table 1). For example, careers such as field technicians or occupations involving management and supervisory roles often require some college or an A.S. degree as minimum qualifications, and these jobs typically pay in the $34,000 - $69,000 range. In contrast, occupations such as farm laborers which do not require any post-secondary preparation and are often filled by individuals with high school diplomas or less typically pay around $18,000.

Table 1: Agriculture-Related National Occupational Employment Outlook for Graduates With or Without Certificates or A.S. Degree.

Occupation	CIP Code	2010 Employment	2010-2020 Projected Job Openings	2010-2020 Projected Job Growth	Median Annual Wage, 2010	Employee Educational Level, 2010	Job Zone Preparation Required
Occupational Outlook with for Graduates with an A.S. or Certificate							
Greenhouse and Nursery Managers	11-9013.01	1,203,000	234,500	-3 to -9%	$69,300	Some College (27%); A.S. (24%); B.S. (45%)	Three: Medium Preparation Needed (vocational schools, job experience,or associates)
Precision Agriculture Technicians	19-4099.02	62,000	33,500	10% to 19%	$43,130	Some College (21%); A.S. (25%); B.S. (43%)	Three: Medium Preparation Needed (vocational schools, job experience, or associates)
Agricultural Technicians	19-4011.01	21,000	8,700	3 to 9%	$34, 070	High School (25%), Some College (25%), B.S. (36%)	Three: Medium Preparation Needed (vocational schools, job experience, or associates)
Buyers and Purchasing Agents, Farm Products	13-1021.00	13,000	3,200	3 to 9%	$55,720	High School (44%), Some College (30%), B.S. (20%)	Three: Medium Preparation Needed (vocational schools, job experience, or associates)
Agricultural Inspectors	45-2011.00	19,000	6,000	-2 to 2%	$42,160	High School (36%); Some College (12%); B.S. (36%)	Three: Medium Preparation Needed (vocational schools, job experience, or associates)
First-Line Supervisors of Landscaping, Lawn Service, Groundskeeping Workers	37-1012.00	203,000	60,100	10 to 19%	$42,160	High School (55%); Some College (11%); A.S. (33%)	Two: Some Preparation Needed (high school diploma)
First-Line Supervisors of Agricultural Crop and Horticultural Workers	45-1011.07	47,000	13,600	-2 to 2%	$43, 660	High School or less (65%); Bachelor's Degree (18%)	Two: Some Preparation Needed (high school diploma)
Occupational Outlook Without an A.S. or Certificate							
Nursery Worker	45-2092.01	746,000	227,400	-3 to -9%	$18,670	Less than high school (23%); High School (57%)	One: Little or No Preparation Needed (high school diploma or GED)
Landscaping and Groundskeeping Workers	37-3011.00	1,152,000	444,400	20 to 28%	$23,570	Less than high school (52%); High School (26%); Some College (16%)	One: Little or No Preparation Needed (high school diploma or GED)
Farmworkers and Laborers, Crop	45-2092.02	746,000	227,400	-3 to -9%	$18,670	N/A	One: Little or No Preparation Needed (high school diploma or GED)

Employment data source: O*Net Online: http://www.onetonline.org/

3) *Discuss how the program will impact campus, island and/or the state's economic development.*

Developing a more diverse economy is a crucial goal of both Kauai and the state of Hawaii. The unique tropical environment of Kauai and the state allows for year-round growing, and the cultivation of tropical specialty crops which along with the availability of agricultural lands make Kauai and the state an ideal location for agricultural development. However, the development of any industry depends on the availability of qualified employees. The proposed A.S. program in Plant Biology and Tropical Agriculture will have a role in educating the workforce needed to meet employer needs and further support the development of an agricultural sector on Kauai and the state.

4) *Discuss how the proposed program addresses workforce needs*

This program will address workforce needs by preparing students with a foundation in Plant Biology and Tropical Agriculture that includes scientific and technical training required by employers. Graduates with a certificate or A.S. degree will qualify for higher paying jobs in the agricultural sector or will have a pathway to pursue further studies in a bachelor's degree program.

5) *Demonstrate how the proposed program aligns with system and campus mission and strategic plan and outcomes.*

The proposed program is in line with UHCC system and Kauai Community College mission and strategic plans. For example, the UH Community College system strategic plan aims to develop a globally competitive workforce by increasing awarded degrees and/or transfers to UH baccalaureate programs by 3% per year in fields where the average wage is at or above

U.S. average, and/or where there is a shortage of qualified workers in Hawaii. This goal also aims to increase the degrees and certificates awarded in Science, Technology, and Math (STEM) fields by 6%. (Goal B: Function as a Seamless State System). An additional goal of the UHCC system strategic plan is the economic contribution to the state's economy as wells as the economic return on investment in education (Goal C: Promote Workforce and Employment). The Kauai Community College mission is focused on providing "practical and theoretical learning," "intellectual pursuits which foster the ability to analyze problems, think critically, and communicate ideas effectively," which maximize the use of technology for global reach and adaptability to change," and "develop partnerships between the campus, community, UH system, state, national, and global organizations."

b. <u>Can identified need be met by existing UH program(s)?</u>

There are currently not any A.S. degrees in agriculture being offered in the UH system. There is a need for a transfer-level A.S. degree for students looking to stay on Kauai while attending community college for two years before transferring to a B.S. degree program at other UH system campuses. The A.S. degree is also a required qualification to enter certain agricultural careers.

1) *List similar degrees or certificates offered in UH System*

At the UH system-wide level, four-year bachelor degree programs in agriculture exist at both UH Manoa and UH Hilo. For example, UH Hilo has B.S. degree programs in Tropical Horticulture and Tropical Plant Science and Agroecology. UH Manoa has a B.S. in Tropical Plant and Soil Sciences with specializations in Environmental Soil Science, Genetics and Physiology, Plant Production and Management, and Tropical Landscape Horticulture. UH Manoa also offers a B.S. degree in Plant and Environmental Protection Sciences. In addition, a program in Sustainable Agriculture is currently in development at UH West Oahu.

At the UH Community Colleges, Hawaii Community College has an A.A.S. and C.A. in Agriculture, and two C.C.'s in Farm Worker and Landscape Worker. Windward Community College has a C.A. in Agribiotech, an A.S.C. in Bioresources and Technology: Plant Biotechnology, and four C.C.'s in: Agricultural Technology, Plant Landscaping, Subtropical Urban Tree Care, and Sustainable Agriculture. Maui College has two A.A.S. and C.A. programs in both Sustainable Crop Management, and Horticulture and Landscape Maintenance, along with two additional C.A.'s in Floriculture Management and Nursery Management. Maui College also has three C.C.'s in Turfgrass Specialist, Landscape Management, and Sustainable Crop Management, and three C.O.'s in Nursery Production, Pest Management, and Agricultural Science.

2) *Describe the impact of the proposed program on current courses or programs at the campus and within the system (is it duplicative? Can resources be leveraged? Can a joint program be offered or campuses collaborate to offer one degree?).*

This A.S. in Plant Biology and Tropical Agriculture proposal is a joint-initiative between Kauai and Leeward Community Colleges. Kauai and Leeward Community Colleges both have an existing A.S.C. in Plant Biology and Tropical Agriculture consisting of similar courses. Both campuses will continue to collaborate to develop the curriculum. At Kauai Community College, the A.S.C. in Plant Biology and Tropical Agriculture will be transferred and converted into new C.C. and C.A.'s in Plant Biology and Tropical Agriculture. Additional agriculture courses will also be developed to satisfy the C.A. and A.S. requirements increasing the diversity of agriculture courses available through Kauai Community College. The curriculum will be designed as a transfer-level degree with students having the option of transferring into the any of the B.S. agriculture programs at UH Manoa or UH Hilo.

3) *If a similar program exists, consult with other campuses, identifying, who has been consulted, what campus and date of consultation. Consultation will include:*

a) The VCAA of the other UH campuses with relevant programs by the VCAA of the campus proposing the degree/certificate
The VCAA's of Kauai and Leeward Community Colleges, James Dire and Mike Pecsok have met to discuss submitting a joint-campus proposal for an A.S. in Plant Biology and Tropical Agriculture as a collaborative initiative between Kauai and Leeward Community Colleges.

b) Colleagues in related disciplines from other campuses have been consulted.
The agriculture faculty members from Kauai and Leeward Community Colleges have been collaborating on curriculum for an A.S. in Plant Biology and Tropical Agriculture from March 2013 to present.

6. Planning the new program

a. Description of the planning period.

1) *Planning period (not to exceed two years or reapplication is necessary)*
A 9-12 month planning period is anticipated from summer 2013 to spring 2014.

2) *Activities to be undertaken during the planning phase*
- Develop new courses and design program curriculum for the C.C., C.A., and A.S. in Plant Biology and Tropical Agriculture
- Collaborate with faculty at Leeward Community College and faculty from related agriculture B.S. programs at UH Hilo and UH Manoa to coordinate curriculum and articulation agreements.
- Develop partnerships with local agricultural stakeholders and employers and utilize an industry advisory committee for review and input on curriculum and for possible internship/co-op programs.
- Following review by industry advisory committee members and faculty collaborators, submit the program action requests and course outlines through the internal campus curriculum committee.
- Enhance recruitment programs to attract students.
- Review available library holdings and student support services as related to program.
- Continue to seek funding to support program's economic sustainability.

3) *Anticipated submission date of program proposal*
It is anticipated that the proposal will be submitted to the Board of Regents in Spring of 2014.

4) *Workload/budget implications during planning period*
Kauai Community College has hired an additional faculty member to develop the curriculum and program proposal during the planning period. Funding for this faculty member is being fully provided by an awarded U.S. Dept. of Labor Community College Career and Technical training (C3T) grant. The planning period will not impact the budget or the workload of existing faculty.

5) *How program will be economically sustainable*
The Dept. of Labor has awarded a consortium of UH Community Colleges a $25 million

Community College Career and Technical training grant which is focused on the development of three disciplines: healthcare, energy, and agriculture. At Kauai Community College, the C3T grant is being used to leverage the initial start-up costs for developing an agriculture program including faculty salary and purchasing supplies and equipment for the agriculture program. An additional C3T2 grant has been awarded with funding budgeted towards renovations of a building for Agriculture classrooms and laboratories. Once approved, the program will be economically sustained through enrollment and tuition. Additional grant opportunities are currently being investigated to enhance the economic sustainability of the program. These may include submitting a joint proposal for a NIFA higher education challenge community college curriculum development grant in spring 2014, or other relevant grant opportunities.

6) *Impact proposed program may have on accreditation*
The proposed program will not impact accreditation. Kauai Community College currently offers A.S. programs in multiple disciplines and is fully accredited by the Accrediting Commission for Community and Junior Colleges / Western Association of Schools and Colleges.

7) *How program will fit within campus and/or system organizational structure*
The Plant Biology and Tropical Agriculture program will fall under the Science and Mathematics Division at Kauai Community College. It will expand the agricultural offerings available at Kauai Community College and also provide a pathway to transfer to any of the agriculture-related B.S. degree programs at UH Manoa or UH Hilo.

b. Description of resources required:

1) *Faculty Resources*
Kauai Community College has one full-time faculty member with expertise in agriculture. A second agriculture faculty member has recently been added with salary funding from a U.S. Dept. of Labor Community College Career and Technical Training (C3T1) grant. The KCC agriculture instructor will continue to teach the existing Plant Biology and Tropical Agriculture courses along with the additional new courses developed for the C.A. and A.S. programs. However, as the new A.S. degree will likely exceed 27 instructional credits in Plant Biology and Tropical Agriculture, an additional faculty member will be needed for the Plant Biology and Tropical Agriculture program. Kauai Community College also has additional science and math faculty with extensive expertise who will be teaching some of the core science and math courses.

2) *Library Resources*
Current library resources located both at Kauai Community College and within the UH system libraries are sufficient. The need for additional library resources will be explored in planning for the proposal.

3) *Physical Resources*
Funding from two different awarded grants will be utilized to renovate classroom space and purchase supplies and equipment for the Plant Biology and Tropical Agriculture program prior to the anticipated program start date. Kauai Community College has received approximately $350,000 from a U.S. Dept. of Labor Community College Career and Technical Training Grant (C3T2) grant. This money is being budgeted towards renovations of an existing campus building

located on the Kauai Community College campus farm. The renovations will create Agriculture-specific lecture and laboratory space, which will be utilized by the new A.S. degree program in Plant Biology and Tropical Agriculture. Kauai Community College also has a large campus farm which can be utilized by students in the program for field experiments and hands-on experiential learning activities. Kauai Community College has also received approximately $227,000 in another U.S. Dept. of Labor Community College Career and Technical Training (C3T1) which is partially budgeted towards equipment and supplies. This grant will be utilized for purchasing equipment and supplies which will be used by the new academic program in Plant Biology and Tropical Agriculture. The money and purchases from these grants will be leveraged in the new Plant Biology and Tropical Agriculture program. As a result, no additional money is requested for purchasing equipment, although a budget for maintaining supplies is included.

4) *Other Resources*
No additional resources are being requested at this time.

c) Three-Year Business Plan. Provide a three-year projected budget for the program that answers the following questions and includes a completed Mini Cost Revenue Template:

1) *What will be the annual costs to implement the program?*
The annual costs to implement the program will be approximately $101,000 to $110,030 due primarily to faculty salary and supplies (Table 2).

2) *What will be the projected enrollment and estimated tuition revenue?*
The projected enrollment will be 30 students by year three, and the estimated tuition revenue will be $113,100 by year three (Table 2).

3) *How will the program be funded?*
The program will be funded by tuition revenue and faculty will also seek outside sources of funding to supplement the program costs.

4) *Does the current or proposed budget include funds or a request for funds for proposed program?*
The program is requesting funds for faculty salary and supplies (Table 2).

5) *Given a "flat budget situation or if anticipated enrollment does not materialize, how will the proposed program be funded?*
If anticipated enrollment does not materialize, budgeting for supplies could be reduced. Also, in a "flat budget" situation, faculty will focus on securing extramural funding in order to offset costs.

Table 2: Projected Three Year Budget.

YEAR	FY 2014-2015	FY 2015-2016	FY 2016-2017
PROGRAM COSTS			
Faculty w/o fringe	55,000	56,650	58,350
Other personnel costs w/o fringe	44,000	45,320	46,680
Library	0	0	0
Equipment	0	0	0
Supplies	2,000	2,000	5,000
TOTAL Expenses	**101,000**	**103,970**	**110,030**
REVENUES			
Projected Enrollment	15	25	30
No. of Courses	8	8	8
No. of Credits	29	31	29
SSH	435	775	870
Tuition Rate/Credit	114	122	130
Total Revenue from Tuition	49,590	94,550	113,100
Other Sources of Income	0	0	0
TOTAL Revenues	**49,590**	**94,550**	**113,100**

7. Describe the impact on current courses or programs.

Kauai Community College currently has a 22-24 credit A.S.C. under the A.A. degree. The A.S.C. will be re-structured into a C.C. and C.A. in Plant Biology and Tropical Agriculture under the new A.S. degree in Plant Biology and Tropical Agriculture. The existing courses will be fully utilized in the new C.C., C.A., and A.S. in Plant Biology and Tropical Agriculture and it is anticipated that approximately 4-6 new courses will be added.

8. If the curriculum includes courses that are offered at other UH campuses, describe how articulation of these courses will be assured prior to the program proposal submission.

Curriculum and courses will be developed in collaboration with other UH campuses and related B.S. programs. Articulation agreements will be developed during the planning period.

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

This program is not multidisciplinary, but multidisciplinary topics may be included in courses.