

New Program Code **Modify Program Code**

Date: 11/29/2018

REQUESTOR CONTACT INFORMATION

Name Shelby Wong Campus Hilo, UH
 Title Curriculum, Catalog, Grad Div Spec Email shelbyw@hawaii.edu
 Office/Dept OVCAA Phone 932-7927

NEW PROGRAM CODE TO CREATE

Institution HIL - University of Hawaii at Hilo Campus ~~Select a Campus~~ UH HILO
 Level UG - Undergraduate Effective Term Fall 2019

	Code (Max. Characters)	Description	Check if requesting new code:
College	(2) <u>AG</u>	<u>Coll of Ag, For, Nat Res Mgt</u>	<input type="checkbox"/> See Banner form STV_COLL
Department	(4) _____	_____	<input type="checkbox"/> See Banner form STV_DEPT
Degree/Certificate	(6) <u>BS</u>	<u>Bachelor of Science</u>	<input type="checkbox"/> See Banner form STV_DEGC
Major	(4) <u>AERS</u>	<u>Aeronautical Science</u>	<input checked="" type="checkbox"/> See Banner form STV_MAJR
Concentration	(4) <u>CPPT</u>	<u>Commercial Professional Pilot</u>	<input checked="" type="checkbox"/> See Banner form STV_MAJR
Minor	(4) _____	_____	<input type="checkbox"/> See Banner form STV_MAJR

If a similar major/concentration code exists in Banner, please list the code: _____

Justification to warrant a new major/concentration code similar to an existing major/concentration code: _____

Is this major/concentration code being used the same way at the other UH campuses? Yes No
 Should this program be available for applicants to select as their planned course of study on the online application? *If yes, student may select the code as their only program of study.* Yes No

RULES PERTAINING TO FINANCIAL AID AND 150% DIRECT SUBSIDIZED LOAN LIMIT LEGISLATION

Is 50% or greater of the classes in this program offered at a location other than the Home Campus? Yes No
 Is this program/major/certificate financial aid eligible? Yes No
 Does this certificate qualify as a Gainful Employment Program (Title IV-eligible certificate program)? Yes No
 See <http://www.ifap.ed.gov/GainfulEmploymentInfo/index.html>

Program Length

In academic years; decimals are acceptable. The length of the program should match what is published by the campus in any online and/or written publication.

4 years

Special Program Designations

See *Special Program Designations Code Definitions on IRAO Program Code Request webpage*

A B N P T U

Required Terms of Enrollment: Fall Spring Summer Extended

IRAO USE ONLY: DATE RECEIVED

ADDITIONAL COMMENTS

New Program Code for Recently BOR approved program:

BS-AERS-CPPT: Bachelor of Science in Aeronautical Science, Commercial Professional Pilot Training Concentration

Effective Semester: Fall 2019

Would like it to show up on the online application for students to declare it for Fall 2019.

ATTACHMENTS

BOR Approved: Sole-credential Certificates, Associate (excluding ATS), Bachelor and Graduate Degrees, and sole credential certificates

- BOR Meeting Minutes & Supporting Documents Curriculum

Chancellor Approved: Concentrations, Certificates and Associate in Technical Studies (ATS) Degree

- Memo from Chancellor to notify Vice President for Academic Planning and Policy regarding program action.
 Curriculum

CERTIFICATES ONLY: Please check one (1) statement. This certificate is a...

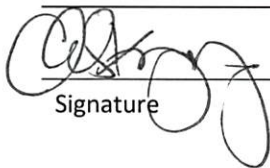
- BOR approved certificate. BOR Meeting/Approval Date: _____
 Chancellor approved within an authorized BOR program. BOR Program: _____
 Chancellor approved CO in accordance with UHCCP 5.203, Section IV.B.10.

VERIFICATIONS

By signing below, I verify that I have reviewed and confirm the above information that is pertinent to my position.

Registrar
(Print Name)

Chelsea Kay-Wong




Signature

1/10/19

Date

Financial Aid Officer
(Print Name)

Sherrie Padilla



Signature

1/2/19

Date

For Community Colleges,
verification of consultation with
OVPCC Academic Affairs:

Suzette Robinson

Signature

Date



UNIVERSITY
of HAWAII®
HILO

Office of the Vice Chancellor for Academic Affairs

November 29, 2018

MEMORANDUM

TO: Marcia Sakai
Interim Chancellor
University of Hawai'i at Hilo

FROM: Ken Hon 
Interim Vice Chancellor for Academic Affairs
University of Hawai'i at Hilo

SUBJECT: Request for Approval of New Program Codes: Aeronautical Sciences

SPECIFIC ACTION REQUESTED:

We request that the following new program codes be approved for use:

1. **BS-AERS-CPPT:** Bachelor of Science in Aeronautical Science, Commercial Professional Pilot Training Track
2. **BS-AERS-CAIT:** Bachelor of Science in Aeronautical Science, Commercial Aerial Information Technology Track

RECOMMENDED EFFECTIVE DATE:

Effective Fall 2019

PURPOSE:

The purpose of this request is to request approval for new program codes from the UH System Institutional Research and Analysis office for the above-mentioned degree programs. The Aeronautical Sciences Bachelor of Science program was approved at the UH BOR meeting on November 14, 2018.

ACTION RECOMMENDED:

We recommend that you approve the new program codes for use for the above-mentioned degree program.

APPROVED/DISAPPROVED:



Marcia Sakai
Interim Chancellor



Date

KH:sw

Cc: Donald Straney, Vice President for Academic Planning & Policy
Zachary Street, Director of Admissions
Chelsea Kay-Wong, University Registrar



Certification of Board Action

TO: David Lassner
President, University of Hawai'i System

FROM: Kendra Oishi
Executive Administrator and Secretary of the Board of Regents

RE: Approval of the Establishment of a New Provisional Bachelor of Science Degree
in Aeronautical Sciences, University of Hawai'i Hilo (UHH)

This certifies that at the November 15, 2018, Board of Regents (Board) meeting the Board approved the establishment of a new provisional Bachelor of Science Degree in Aeronautical Sciences, University of Hawai'i Hilo, as stated in the specific action requested in the memorandum dated October 25, 2018 (Attachment A), and further amended the specific action to require a copy of the Memorandum of Understanding with the ATP Flight School be provided to the regents.

Certified as of November 15, 2018

A handwritten signature in blue ink that reads 'Kendra Oishi'.

Kendra Oishi
Executive Administrator and Secretary
Board of Regents, University of Hawaii

Attachment A (first page of action memo)

DTS 19155

University of Hawai'i at Hilo Administration
Office of the Chancellor



UNIVERSITY
of HAWAII
HILO

UNIVERSITY OF HAWAII
BOARD OF REGENTS

18 OCT 25 P3:45

RECEIVED

October 25, 2018

'18 OCT 25 P3:21

MEMORANDUM

UNIVERSITY OF HAWAII
PRESIDENT'S OFFICE

TO: Lee Putnam
Chair, Board of Regents, University of Hawai'i

VIA: David Lassner *David Lassner*
President, University of Hawai'i

VIA: Donald Straney *Donald D. Straney*
Vice President for Academic Planning and Policy

FROM: Marcia Sakai *Marcia Sakai*
Interim Chancellor, University of Hawai'i at Hilo

SUBJECT: Request to establish a new provisional Bachelor of Science degree in
Aeronautical Sciences, University of Hawai'i Hilo

SPECIFIC ACTION REQUESTED:

It is respectfully requested that the University of Hawai'i Board of Regents approve the establishment of a new provisional degree, the Bachelor of Science in Aeronautical Sciences, within the College of Agriculture, Forestry, and Natural Resource Management, University of Hawai'i Hilo (UH Hilo).

RECOMMENDED EFFECTIVE DATE:

Fall 2019

ADDITIONAL COST:

The proposed program will require an initial campus investment of \$107,000 to demonstrate feasibility, but at the same time will leverage existing investments in the College of Agriculture, Forestry, and Natural Resource Management; the College of Arts

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and Sciences; and the College of Natural and Health Sciences. With positive proof of concept, we will seek an appropriation to grow the program.

PURPOSE:

The proposed Bachelor of Science in Aeronautical Sciences is designed to serve as a pivot toward aeronautical science and its applications that will integrate with UH Hilo's existing STEM program strengths in general education as well as in agriculture, conservation biology, natural hazards, marine and terrestrial resources, astronomy, and GIS education and research. The program will have concentrations in Commercial Professional Pilot Training (CPPT) and Commercial Aerial Information Technology (CAIT), where there is a high projected workforce need in the State.

BACKGROUND:

Board of Regents policy 5.201 "Instructional Programs" sets that policy for the establishment of all new instructional programs.

At its January 12, 2017 meeting, the Board of Regents Committee on Academic and Student Affairs considered a request from UH Hilo to establish, as provisional, the Aeronautical Sciences B.S. The proposed program was designed to provide a 4-year degree pathway for students interested in a fixed wing pilot career track. It also included flight-training courses across the four years of the program, delivered by a third-party provider operating out of the Hilo International Airport. The Committee expressed concern regarding enterprise and operational risks associated with the flight training provider and the Hilo airport location. The Committee deferred the proposal until further information could be provided.

The current proposed program is broadened to offer students two different, but connected pathways into commercial aviation. Both concentrations share a common core of commercial aviation courses for the first three years, coupled with a final year of specialization in either 1) CPPT or 2) CAIT. The first option has been re-designed to address concerns of risk and capacity of flight training raised earlier by the Committee. The second option provides a productive path for students interested in aeronautical science applications but not in obtaining a commercial pilot's license.

The proposed program satisfies the criteria for decision-making regarding the establishment of provisional degree programs RP 5.201, III.A. (1a) and (3) as follows:

- (1) a. The Board shall approve the establishment of all new instructional programs granting academic credit leading to a degree or credential, upon recommendation by the president.

and

(3) All new program proposals shall be consistent with the institution's mission.

UH Hilo's mission is to challenge students to reach their highest level of academic achievement by inspiring learning, discovery and creativity inside and outside the classroom. We are reminded of this by the proverb 'A'ohe pau ka 'ike i ka halau ho'okahi/One learns from many sources, which serves as strong guidance for our decision-making. Our kuleana/responsibility is to improve the quality of life of the people of Hawai'i, the Pacific and the world.

Given this mission and direction, UH Hilo's program array demonstrates the campus' priority for programs that take advantage of the unique physical and social characteristics of the island and that serve students who seek opportunities for highly engaging and experiential learning (UH Integrated Academic and Facilities Plan). The proposed Bachelor of Science in Aeronautical Sciences aligns with UH Hilo's focus on professional programs that prepare students for the workforce, including accounting, business, education, nursing, pharmacy, and counseling psychology, by now including a pathway to commercial aviation. The proposed program also aligns with UH Hilo's focus on the application of science in such fields as agriculture, conservation biology, geography, geology, environmental sciences, marine science, and astronomy, using tools for information development, such as GIS, data visualization and data science. The proposed program would add to our students' toolkit for data collection, information creation, and information communication, and strengthen both undergraduate and graduate research across those fields.

The proposed Bachelor of Science in Aeronautical Sciences program will leverage UH Hilo's strength in undergraduate STEM disciplines, strongly coupled with experiential learning, in an area where there is high projected workforce need in the State.

The first concentration in CPPT provides a simple, direct pathway to earn all the FAA licenses and certificates required to pursue a commercial Airline Transport Pilot license and begin a career as a commercial airline pilot. This pathway is similar to the military pilot training model, where intensive flight school follows completion of a college degree. The CPPT concentration is structured as three years of university classroom and flight simulator learning coupled with a final year at a 6-8 month flight school program of the student's choice. Credit for flight school is transferred back to UH Hilo to complete the degree, saving students the cost of an additional year of college.

The concentration is designed to prepare students with both technical and management expertise in the field of commercial aviation along with the opportunity to pass many of the written exams required for FAA licenses and certificates in advance of attending flight school. Students who complete this program will have all the FAA certificates and licenses to be qualified to fly commercial multi-engine aircraft in nearly all conditions and

will be eligible for the Airline Transport Pilot certificate upon completion of the requisite flight time.

The second concentration in CAIT will provide the training and background to attain current FAA licensing for the highly restricted commercial UAS operations of small drones, as well as preparation for future full integration of large UAS operations into commercial airspace. The first three years of the program develop a solid background in commercial aviation that will be needed by commercial UAS pilots as this nascent industry transitions to full commercial operations in the near future. The CAIT concentration is designed to be coupled with a focus in Geography, a STEM field, or Computer Science using available electives. Data Science is an emerging focus.

This concentration will create opportunities for the University to establish new partnerships with private industry, educational institutions, and government agencies. Fields such as agriculture, conservation biology, geography, environmental sciences, marine science, and astronomy have ever-increasing need for environmental data with high spatial and temporal resolutions, which are not generally available by other means. Students with a strong background in commercial aviation, UAS operations, payloads, instrument calibration, data handling, and interpretation will be in high demand. UH Hilo has an existing relationship with the FAA that allows us to obtain Certificates of Waiver or Authorization (COAs) for Research and Training on a per project basis, which would allow additional privileges for CAIT.

An October 2018 EMSI analysis from the Office of the Vice President for Community Colleges Institutional Research Office reports:

- Between 2016 and 2026, Hawai'i will see 207 new airline pilot, co-pilot and flight engineer position openings.
- During the same time period, Hawai'i will see 186 replacement pilot position openings.
- The demand for commercial level UAS pilots with information technology backgrounds is difficult to assess as this is an emerging field. However, it appears that it will be significant. A recent report by the FAA suggests that there will be an exponential increase in these positions in the near future.

Based on our review of enrollment by Hawaii residents at select out-of-state flight training universities, contact with Civil Air Patrol squadrons, communication from interested veterans, students and families, and student interest in the UAS certificate program, we estimate that program enrollment will exceed 80 students at maturity, including participation from UH community colleges.

The proposed B.S. in Aeronautical Science is a campus priority. It will provide important career training and opportunities for students in both commercial aviation and the rapidly growing field of unmanned aviation technology. The proposed program will support economic development opportunities on Hawai'i island by creating activity in the

Lee Putnam, Chair, Board of Regents

October 25, 2018

Page 5 of 5

aeronautics/aerospace/astronomy cluster and align with DBEDT's plan to build and strengthen Astronomy and Aerospace on Hawai'i island.

ACTION RECOMMENDED:

It is recommended that the Board of Regents establish a new provisional degree, the Bachelor of Science in Aeronautical Science in the College of Agriculture, Forestry and Natural Resource Management at the University of Hawai'i Hilo.

Attachment

cc:: Kendra Oishi, Executive Administrator and Secretary of the Board, University of Hawai'i

Kenneth Hon, Interim Vice Chancellor, Academic Affairs

BACHELOR OF SCIENCE IN AERONAUTICAL SCIENCES: A PROPOSAL FOR PROVISIONAL STATUS FROM UH HILO

I. Program Purpose and Outcomes

Purpose

Hawai'i is the only state completely surrounded by ocean and consists of a 2,000 mile long chain of islands with the fourth largest coastline in the United States. Hawai'i is heavily dependent on the aviation industry to support the economic driver of tourism and to transport large amounts of freight to and between the islands. Advances in aeronautics will continue to be increasingly important to monitor and manage remote lands, agriculture, natural hazards, fisheries, and the immense marine resource of the Northwest Hawaiian Islands. The proposed degree in Aeronautical Sciences will provide an opportunity for residents of Hawai'i to meet future needs in the commercial aviation industry and the rapidly expanding field of Unmanned Aviation Systems (UAS).

The proposed Bachelor of Science in Aeronautical Sciences will provide important career training and opportunities in both commercial aviation and the rapidly growing field of unmanned aviation technology. Establishing a degree will also provide opportunities to create new partnerships with private industry, educational institutions, and government agencies that are not currently possible. Developing aeronautical sciences teaching and research fits with the Hawai'i DBEDT's plans to build and strengthen Astronomy and Aerospace on Hawai'i Island. Unmanned aviation technology fits well within UH Hilo's current mission of applied science and agriculture research, data science, and astronomy. These fields are tied together by the ever increasing need for environmental data with high spatial and temporal resolutions, which are not generally available by other means. Students with a strong background in commercial aviation, UAS operations, payloads, instrument calibration, data handling, and interpretation will be in high demand as this nascent industry continues its rapid expansion. This degree concentration will add an important dimension of applied science that will integrate with UH Hilo's current research being conducted with state and federal agencies, as well as private stakeholders.

Outcomes

The CIP code for this program will be: 49.0102 Airline/Commercial/Professional Pilot and Flight Crew¹.

The Bachelor of Science in Aeronautical Sciences will offer students two different pathways into commercial aviation, a Commercial Professional Pilot Training concentration and a Commercial Aerial Information Technology concentration. Both concentrations share a common core of commercial aviation courses for the first 3 years, coupled with a final year of specialization in either 1) Commercial Professional Pilot Training or 2) Commercial Aerial Information Technology.

The first concentration in Commercial Professional Pilot Training (CPPT) provides a simple, direct pathway to earn all the FAA licenses and certificates required to pursue a commercial Airline Transport Pilot license and begin a career as a commercial airline pilot. The Aeronautical Sciences Bachelor's degree is structured in a fashion similar to military pilot training, where intensive flight school follows completion of a college degree. The CPPT concentration is structured as 3 years of university classroom and flight simulator learning, coupled with a final year at a 6-8 month flight school program. Credit for flight school is then transferred back to UH

¹ <https://nces.ed.gov/ipeds/cipcode/cipdetail.aspx?y=55&cipid=88673>

Hilo to complete the degree, saving students the cost of an additional year of college. The concentration is designed to prepare students with both technical and management expertise in the field of commercial aviation along with the opportunity to pass many of the written exams required for FAA licenses and certificates in advance of attending flight school. Students who complete this program will have all the FAA certificates and licenses to be qualified to fly commercial multi-engine aircraft in nearly all conditions and will be eligible for the Airline Transport Pilot certificate upon completion of the requisite flight time.

The second concentration in Commercial Aerial Information Technology (CAIT) will provide the training and background to attain current FAA licensing for the currently highly restricted commercial UAS operations of small drones, as well as preparation for future full integration of large UAS operations into commercial airspace. The first 3 years of the program develop a solid background in commercial aviation that will be needed by commercial UAS pilots as this nascent industry transitions to full blown commercial operations in the near future. The CAIT concentration is designed to be coupled with a focus in Data Science, Geography, a STEM field or Computer Science using available electives.

Program Learning Outcomes are designed to meet the stringent requirements of the FAA and high expectations set by the commercial aviation industry :

1. Ability to pilot and command single and multi- engine private and commercial aircraft in a variety of visual and instrument conditions or ability to fly and control large commercial unmanned aircraft in commercial airspace in a wide variety of conditions.
2. Demonstrate an understanding of the performance and operating characteristics of both manned and unmanned aircraft. Understand the principles of aerodynamics, aircraft design/construction, and automated control systems.
3. Thorough knowledge and understanding of ground and in-flight support aviation operations and applicable FAA regulations for both commercial aviation and commercial UAS operations.
4. Ability to create approved written flight plans and other professional and technical written reports including an accurate and detailed flight logbook.
5. Understand principles of meteorology and navigation, ability to use GPS systems, fluency with aviation maps and FAA radio location (VOR) systems, ability to navigate an airplane or UAS between points well beyond visual range.
6. Thorough understanding of the principles and regulations applied to aviation safety. Ability to perform risk assessment related to aviation safety for both commercial aviation and commercial UAS operations.
7. Proficiency in communications with regional FAA, airport tower authorities, ground controllers, and other aircraft.
8. Thorough knowledge of regulations related to the maintenance of aircraft-UAS and associated systems.
9. Explain the integration of airports, airspace, and air traffic control in managing the National Airspace System. Thorough working knowledge of the airspace and support systems.
10. Demonstrate a thorough understanding of national and international aviation law and regulations.
11. Proficiency in professional communications and oral presentations.
12. Demonstrate competence in using computers at a level consistent with current professional practice for commercial pilots or comprehensive understanding of flight control, sensor applications, calibrations, data collection and reduction, and interpretation of a wide range of applications for UAS.

The above outcomes establish what students will know and be able to do upon completion of the program.

Alignment with the UH System and UH Hilo Integrated Academic and Facilities Plans.

Aviation plays a fundamental role in the lives of nearly everyone in the State of Hawai'i. The proposed Bachelor of Science Degree in Aeronautical Sciences is an applied degree that will make education more accessible for students interested in applied aviation careers. Aviation produces high quality jobs that will improve the lives of Hawai'i's citizens, an underlying principle of the UH IAFP. The proposed program offers a relatively low cost entry into fields of applied aeronautical science with potential for future expansion. We are in a period of significant technological change where advances in robotics and machine learning are going to change the way commercial and non-commercial enterprises operate. While the combination of commercial airline pilots and UAS pilots may initially appear to be two completely different fields, in 10 to 20 years the use of large robotic aircraft systems will most likely be fully integrated into national and international airspace. A large number of new jobs will be created at this nexus of old and new technologies. This is an opportunity for the University of Hawai'i to identify an emerging field and to develop educational programs that train the future workforce for this field.

UH Hilo has a strong focus on applied research in agriculture, conservation biology, natural hazards, astronomy, and marine and terrestrial resources along with offering numerous workforce ready majors in Education, Nursing, Agriculture, Business Administration, and applied STEM fields, including graduate programs in Pharmacy and Tropical Conservation Biology and Environmental Sciences (TCBES). The Aeronautical Sciences degree and especially the Commercial Aerial Information Technology concentration are complementary to these fields, strengthening both undergraduate and graduate research in Geography, Environmental Sciences, Biology, Marine Science, Data Science, Agriculture, Geology, and TCBES.

Evidence of Continuing Need for the Program

The FAA and BLS predict that there will be a steadily increasing demand for both commercial airline pilots. The field of commercial UAS pilots is so new that there are very few predictions on job numbers, however, the FAA anticipates an explosive growth in the sales of commercial UAS aircraft in the coming decade.

Nationally, there will be a moderate number of high paying (>\$100,000) airline pilot positions with the major airlines, largely due to retirement over the next two decades within the United States. Major U.S. airlines still have a large pool of experienced regional pilots to choose from for each of these openings. Globally there will be a large demand for pilots within international airlines, especially those in Asia and the Middle East. These airlines pay 10-20% premiums for fluent English-speaking pilots that can navigate international airspace. A 2014 report by Boeing that is still widely quoted predicted the need for over 500,000 pilots by 2036 resulting in a global need for 26,000 pilots per year. In North America, there is a projected need for about 4,400 pilots per year for the next two decades.

The real growth in pilot jobs in the United States has been within regional carriers affiliated with major airlines over the past several years. Projections show that in the next few years there will be more passenger miles flown within the U.S. on regional carriers than on major airlines and the need for regional pilots will continue to expand. The rapid increase in demand for regional pilots began several years ago and left many of these carriers with insufficient crew to fly scheduled routes. It takes approximately 10 pilots to keep a regional aircraft in full service compared to the 14-18 pilots needed for aircraft flown by major airlines. This rapid

growth has caused many of the majors to begin raising entry salaries from \$20,000-\$40,000 dollars to \$40,000 to \$60,000 in order to attract and retain pilots. The regional airlines are aggressively recruiting pilots straight from flight school.

An October 2018 EMSI analysis from the Office of the Vice President for Community Colleges Institutional Research Office reports the following demands within the State of Hawai'i. Between 2016 and 2026, Hawai'i will see 207 new airline pilot, co-pilot and flight engineer position openings per year along with 186 replacement pilot openings. Even if the UH Hilo program graduated all of our projected enrollment, it would represent less than 10% of this projected need. Mokulele Air is willing to consider UH Hilo graduates for positions as second in command to earn hours and Hawaiian Airlines expressed support for the program and a desire to consider graduates once they had accumulated sufficient flight time. Empire Air, which runs Ohana Air, is one of the 11 regional airlines recruiting at an event on November 10th in Waikiki for pilots directly with 250 hours of flight time, roughly what UH Hilo graduates with a commercial multi-engine rated pilot rating will have coming directly at graduation.

The demand for commercial level UAS pilots with information technology backgrounds is more difficult to assess as this is an emerging field, but it appears it will be significant. A recent report by the FAA suggests that the use of UAS is set to exponentially expand in the next 5-10 years. The FAA predicts that commercial UAS operations will expand from around 73,000 to a minimum of 300,000 by 2022. In addition, current regulations allow only limited flying of large UAS (>55 kg) in commercial airspace. The current fleet of high end commercial drones is predicted to increase from 16,000 today to over 50,000 by 2020, which will require a significant increase in highly skilled operators. At some point in the near future, commercial UAS, similar to or larger than current military models, will begin to be integrated into commercial airspace in the United States. While the FAA is largely quiet about ongoing rulemaking, the Airline Pilots Association has made it clear that UAS using commercial airspace should meet both commercial pilot and commercial aircraft standards if they are to be integrated in the commercial airways of the National Airspace System.

II. Program Organization

Both concentrations of the program will share identical curriculum during the first 3 years of the program. This will ensure that all graduates have the necessary background to pilot commercial aircraft within the National Airspace System governed by the FAA. The common curriculum includes fourteen new classes including six 1 credit hour flight simulation labs along with eight 3 credit hour courses in safety, weather, navigation, aviation operations and resources, and career development. The rest of the courses are a mixture of General Education, basic mathematics, chemistry, and physics, along with five electives that can be used to focus each students degree.

The intention is to make the first two years of the program available to community college students across the state. All of the non-aviation courses within the first two years are found at all of the community colleges in Hawai'i. The two subject matter courses covering safety and navigation will be offered to all students via Distance Education, thus allowing community college students to complete the bulk of the required courses on their home island. The simulator courses require special equipment and face to face instruction with a pilot and need to be taught at the UH Hilo campus. A special condensed version of these courses will be offered during the summer to students that wish to matriculate from community colleges.

Years 1-3 Curriculum to be Completed at UH Hilo for Both Concentrations:

Fall Year 1		Fall Year 2		Fall Year 3	
AERS 101 Elem Private Pilot Operations I	1	AERS 220 Elem Multi-Engine Ops I	1	AERS 260 Aviation Systems & Instruments	1
GE Multicultural Perspectives I	3	AERS 250 Aviation Safety	3	AERS 340 Advanced Simulated Maneuvers	3
GE Arts, Humanities, Literature	3	GE GEOG 201 Interpreting GEOG Data	3	AERS 355 Domestic & Intl Navigation	3
GE ENG 100 Composition I	3	GE CHEM 151 Elem Survey of Chem	3	AERS 387 Crew Resource Management	3
GE Social Science I	3	GE CHEM 151L Elem Survey of Chem Lab	1	GE Social Science II	3
Elective	3	Elective	3	Writing Intensive Elective	3
Total Credits:	16	Total Credits:	14	Total Credits:	16
Spring Year 1		Spring Year 2		Spring Year 3	
AERS 102 Elem Private Pilot Operations II	1	AERS 221 Elem Multi-Engine Ops II	1	AERS 370 Preparation for Practical Single/Multi Engine Flying	1
GE MATH 140 or 140X Precalculus	3	AERS 251 Aviation Weather	3	AERS 471 Aviation Operations	3
GE Language Arts	3	GE Hawai'i Pan Pacific	3	AERS 472 Aviation Career Development (GCC)	3
GE Biological Science	3	PHYS 151 College Physics I	3	AERS 473 Leadership as a Pilot	3
GE Arts, Humanities, Literature	3	PHYS 151L College Physics I Lab	1	Writing Intensive 300-400 Elective	3
GE Multicultural Perspectives II	3	Elective	1	Elective	1
Total Credits:	16	Total Credits:	14	Total Credits:	14

During the 4th year of the degree program, the requirements of the two concentrations diverge. Students seeking a the Commercial Professional Pilot Training will attend an FAA certified flight school to obtain the necessary FAA licenses and certifications, while those pursuing the Aerial Information Technology concentration will remain at the UH Hilo campus for concentrated courses in UAS flight and data collection and interpretation.

Commercial Professional Pilot Training Concentration (CPPT) To be completed at a flight provider of the students choice		Commercial Aerial Information Technology Concentration (CAIT) To be completed at UH Hilo	
Fall Year 4		Fall Year 4	
AERS 201 Private Pilot: Pre-Solo	5	AERS 152 Introduction to UAS	3
AERS 202 Private Pilot: Solo & Checkride	5	GEOG 470 Remote Sensing/Air Photo	3
AERS 203 Cross Country Single Engine Pilot in Charge	5	AERS 354 UAS Robotics	3
		Elective	3
		Elective	3
Total Credits:	15	Total Credits:	15
Spring Year 4		Spring Year 4	
AERS 310 Instrument Basic	3	AERS 352 UAS Mission Plans and Simulation	3
AERS 311 Instrument Advanced	3	AERS 452 UAS Flight	3
AERS 388 Crew Resource Mgmt. and Crew Operations	2	GEOG 480 Geog Info Sys & Visualization	3
AERS 420 Commercial Certificate (Multi-Engine)	5	Elective	3
AERS 421 Commercial Single-Engine Add On	2	Elective	3
Total Credits:	15	Total Credits:	15

The 4th year of commercial pilot training for all students will initially be at the ATP Flight School in Mesa Arizona. Training is comprised of eight flight training courses and corresponding ground school components. Students are required to take and pass all the required FAA flight and written examinations to achieve their commercial multi-engine instrument rating and will also be given the opportunity to qualify as certified flight instructors. Students completing this course of study will eligible to earn their Airline Transport Pilot certificate upon completion of 1500 hours of flight time (250 hours are earned during training) earned while flying as a certified flight instructor, a second in command at a regional airline, working for private transportation companies, or other venues (freight, medical transport, tourism, etc.).

The UH Office of General Counsel has recommended that the UH Hilo enter into a formalized MOU with ATP flight school similar to those MOU's held by participating clinical sites for university health education programs. The MOU will outline respective areas of liability and will be finalized upon final approval of the program.

Structuring the commercial pilot training in a manner similar to military pilot training provides several significant advantages over traditional programs where flight training is spread out over four years. Operating as a cohort will instill the sense of professionalism required to succeed in the aviation field. Students are provided a

thorough background in the theoretical, applied, and managerial aspects of professional flight prior to flight training. This will let the students focus on the important aspects of learning to fly and gives them a significant advantage over students applying for flight school with no background.

UH Hilo chose to initially partner with ATP as it is a large national flight training provider that can guarantee a concentrated course of flight training for all UH Hilo students, reasonable costs and available financing, a well run professional environment that instills the right attitude for a successful career, extensive aircraft resources and aircraft maintenance facilities, high retention and completion rates (90% for students with some aviation background), guaranteed jobs as flight instructors for qualified students, and extensive employment connections with regional airlines.

The 4th year of aerial information technology will consist of required courses in remote sensing, geographical information systems (GIS), UAS flight and technology, and four electives directed toward advanced remote sensing and GIS, data collection and interpretation. In reality, because there are five electives in the first three years students can choose to take courses stretched over a longer time period. The nine electives allow students in this concentration to obtain a subject certificate in Data Science, minor in other STEM fields, or obtain a double major in Geography.

Admission Policies

The proposed program will operate under a cohort model to attract, engage, and retain students interested in commercial aviation careers. Airlines are focused on ensuring that pilots are trained to high professional standards from the first day. UH Hilo students will be housed together in the residence halls as a living learning community centered on aviation careers. The cohort model works to reinforce desired behaviors and to create a sense of belonging to a professional unit. Development of an aviation-based student community will encourage students to attend UH Hilo from the beginning.

Students in both concentrations in the program will be required to meet the UH Hilo application requirements.

In addition, for admission to the Commercial Pilot Professional Flight concentration include proof of the ability to pass a FAA first-class medical physical examination, administered by a FAA Certified Aeromedical Examiner Physician and documentation of at least one hour of flight time recorded in a pilot's logbook. The medical exam is required to obtain FAA licenses and the flight time is to assure students understand what flying a small aircraft actually entails.

There are no additional admission policies for students entering into the Commercial Aerial Information Technology concentration.

Transfer Policies

The Commercial Aerial Information Technology concentration will interface naturally with UH Community College (UHCC) programs due to common requirements and technology related course offerings in robotics and electronics. In collaboration with Hawai'i Community College, we are planning to offer courses in these fields accessible by both HawCC and UH Hilo students. UH Hilo will also offer a path for interested UHCC students to complete years 1 and 2 of the program concurrently with completion of their Associate Degree by offering the second year content courses of Aviation Safety and Weather online and creating special summer

flight simulator institutes for UHCC students. This will allow UHCC students to seamlessly enter the program in the third year of either concentration.

III. Student Demand

Applied aeronautical sciences programs are not presently offered within the State of Hawai'i. Hawai'i residents who wish to pursue this must leave the state to enroll in an aeronautical science program.

The Aeronautical Sciences degree directly serves a state need for producing commercial pilots for the local commercial aviation industry. It has the potential to attract and retain Hawai'i resident students who currently enroll in more costly aeronautical science programs at other institutions. Students pursuing this concentration to become airline pilots will be able to complete their on-campus coursework in 3 years, making it less expensive than a traditional 4 year degree. This results in an effective discount of \$20,000 to \$25,000 to the cost of flight school for Hawai'i students from about \$75,000 to \$50-55,000. The program produces significant cumulative costs savings for residents of Hawai'i of around \$250,000 per 10 students annually completing the program, which is roughly 70 percent of the cost of delivering the program. We believe that the cost savings associated with the UH Hilo Commercial Airline Pilot concentration will encourage more local students to pursue higher education here.

There will be similar but smaller cost savings for students following the Commercial Aerial Information Technology concentration. These students will benefit by not having to pay significantly more in out of state tuition to become certified UAS operators with data analysis capabilities. We also feel that because UAS is so strongly interconnected with research applications at UH Hilo, students will receive a more comprehensive education than they might at an university focused solely on aviation.

It is anticipated that twenty students will enroll in the Commercial Professional Pilot Training (CPPT) concentration each academic year, and ten students in the Commercial Aerial Information Technology (CAIT) concentration starting in the fall of 2020. We have projected 50% fewer students in Fall 2019 due to the short time from approval to implementation. Twenty students in the Commercial Professional Pilot Training concentration is a moderate estimate based upon various potential sources of students, and an average of 40 Hawai'i students in comparable Aeronautical Sciences programs in the continental U.S. and the price advantage for enrollment in the proposed program at UH Hilo.

Enrollment (Fall Headcount)	Year 1 19-20	Year 2 20-21	Year 3 21-22	Year 4 22-23
Cohort 1 Pilot	10	7	9*	0
Cohort 1 UAS	5	4	6*	3
Cohort 2 Pilot		20	11	12*
Cohort 2 UAS		10	7	9*
Cohort 3 Pilot			20	11
Cohort 3 UAS			10	7
Cohort 4 Pilot				20
Cohort 4 UAS				10
Totals:	15	41	69	81

* Includes addition of 3 articulated UHCC students per concentration in the 3rd year.

We expect to recruit approximately 30 resident students per year into the proposed program, 20 into the Commercial Professional Pilot Training Concentration (CPPT) and 10 into the Commercial Aerial Information Technology concentration (CAIT). The overall numbers are based upon reasonable retention rates similar to UH Hilo's overall rates for this program. In addition, we accounted for 3 community college transfers entering each concentration in the 3rd year.

UH Hilo is currently developing a recruitment strategy for the program which will begin upon BOR approval of the program. The strategy includes developing print material, using of social media, developing articulation agreements with community colleges, visiting local Civil Air Patrol Squadrons (composed of high school students interested in aviation), and visiting Big Island and Oahu High Schools.

Program Cost Savings Compared to Continental U.S. Four Year Degree Programs

One of the primary goals of the Aeronautical Sciences degree is to offer Hawai'i residents a more affordable pathway into aviation related careers. The proposed program will offer significant cost savings over similar programs offered in the continental U.S., as illustrated in the table below.

**Estimated 4-Year Cost of Attendance- Student Entering in Fall 2019
Commercial Professional Pilot Training Concentration**

	UH Hilo	Embry Riddle Aeronautical U Prescott ²	Arizona State University ³	Central Washington University ⁴
Flight Instruction	\$75,995	\$80,000	\$82,369	\$61,950
Tuition	\$22,033	\$142,616	\$113,344	\$86,332
Fees	\$1,426	\$7,272	\$2,872	\$7,608
Books and Supplies	\$4,482	\$5,600	\$5,200	\$4,008
Meals and Housing	\$34,259	\$45,576	\$52,984	\$44,460
Personal Expenses	\$13,238	\$13,635	\$7,928	\$7,008
Transportation	\$1,939	\$11,424	\$5,504	\$5,040
Loans Fees	\$242		\$288	
Airfare Transport to/from HI	\$1,000	\$4,000	\$4,000	\$4,000
Cost of Attendance for 4 years:	\$154,613	\$310,123	\$274,489	\$220,406

The cost of the UH Hilo pilot training program varies between 50% and 70% of similar four year degrees offered on the mainland. A detailed list of costs to students for the proposed UH Hilo pilot training program are provided in the table below. Total four-year costs actually can vary from \$121,664 to \$159,856, depending upon living arrangements.

Currently ATP flight schools' cost for flight instruction is fixed at: \$75,995⁵ for an intensive 9 month program which allows students to earn all required FAA licenses. If flight costs at ATP flight schools increase, students will have alternative options as we create articulation agreements with other major flight instruction providers.

² <https://prescott.erau.edu/admissions/estimated-costs/>

³ <https://students.asu.edu/standard-cost-attendance#nonresident>

⁴ <http://www.cwu.edu/financial-aid/2018-2019-cost-attendance>

⁵ <https://atpflightschool.com/airline-career-pilot-program/>

Estimated 4-Year Cost of Attendance⁶ for Student Living in Residence Halls at UH-Hilo in Years 1-3

	2019-2020	2020-2021	2021-2022	2022-2023 (CPPT)	Total for 4 Years (CPPT):
Flight Instruction				\$75,995	\$75,995
Tuition	\$7,272	\$7,344	\$7,417		\$22,033
Fees	\$461	\$475	\$490		\$1,426
Books and Supplies	\$1,071	\$1,103	\$1,136	\$1,171	\$4,482
Meals and Housing	\$8,495	\$8,750	\$9,013	\$8,000	\$34,259
Personal Expenses	\$3,164	\$3,259	\$3,357	\$3,458	\$13,238
Transportation	\$464	\$477	\$492	\$506	\$1,939
Loans Fees	\$78	\$81	\$83		\$242
Total CPPT Concentration:	\$21,006	\$21,490	\$21,988	\$89,130	\$153,613
Total for CAIT Concentration:	\$21,006	\$21,490	\$21,988	\$22,499	\$86,983

The costs for the Aerial Information Technology concentration are the same as any other 4 year degree offered at UH Hilo. The program will also provide significant cost savings for students who otherwise would be forced to turn to universities at other locations in the U.S. for a similar degree.

IV. Program Resources and Efficiency

The Bachelor of Science degree in Aeronautical Sciences will require approximately \$200,000 in new equipment expenses and 3.67 Faculty FTE phased in over 4 years. The faculty positions will either be reallocated or be allocated as new positions to UH Hilo. The current physical facilities at UH Hilo are sufficient to provide office, classroom, and simulator laboratory space for this program.

The request for reallocated or new faculty positions is based upon teaching 18 new courses with a cumulative SSH of 2710 calculated based upon the number of students shown in the enrollment table.

Courses, Sections, SSH (Annual)	Year 1	Year 2	Year 3	Year 4
Projected New Courses	2	4	8	4
Projected New Sections per Course	1	1	1	1
Projected New SSH (added by year)	30	328	1380	972

In year 1, an Instructor with commercial pilot qualifications will be hired to begin teaching developing simulator courses and developing the online weather and safety courses to be offered in year 2. An assistant or

⁶ <https://hilo.hawaii.edu/financialaid/CostofAttendance1819.php>

associate professor in aeronautical sciences will be hired in year 2 to develop the courses for year 3. An educational specialist will also be hired in year 2 to manage the program and to provide more of the time intensive teaching required by the simulator laboratory courses. In year 4, the program plans to add a 0.67 FTE Instructor, who will lead the Commercial Aerial Information Technology concentration. The program's two concentrations will be fully staffed with 3.67 FTE.

Personnel (Instructional)	Year 1 19-20	Year 2 20-21	Year 3 21-22	Year 4 22-23
Projected New Faculty FTE	1.0	2.0	0	.67
Projected FTE Reallocations	0	0	0	0
Projected New Faculty Salaries	80,000	165,000	0	47,000
Cumulative Faculty Salaries	80,000	245,000	245,000	302,000

The 3.67 FTE program personnel will require office space that is easily accommodated on the UH Hilo campus. All members of the Aeronautical Science faculty will serve as mentors and academic advisors to program students.

We have worked with all programs that may be impacted by the implementation of the proposed program and have been assured by the respective program chairs that the proposed program students are welcome in their classes.

The proposed program will require classroom instructional space at UH Hilo for the simulator lab and content courses. At maximum this will be 10 semester hours of classroom space per week for instruction. There is sufficient space to accommodate the classroom needs of the proposed program—even at full capacity. The simulators will require a full time laboratory space, which can be provided.

The program plans to purchase 2 CRX open cockpit professional simulators for a total cost of \$50,000 each. During the first academic year of implementation, there will be another \$20,000 cost to purchase 6 desktop flight simulators to be used by students both during and outside of class hours. The estimated maintenance cost for all simulator equipment is \$20,000 annually.

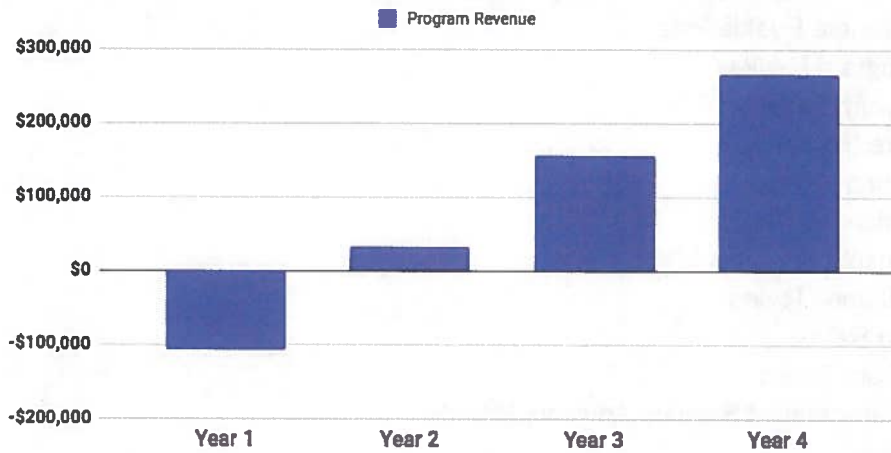
Program Operating Costs (equipment, accreditation, fees, etc)	Year 1 19-20	Year 2 20-21	Year 3 21-22	Year 4 22-23
- 6 Desktop Flight Simulators	\$20,000			
- 2 CRX Open Cockpit Simulators	\$100,000			
- Simulator Maintenance/Year	\$20,000	\$20,000	\$20,000	\$20,000
- UAS Aircraft and Sensors			\$80,000	
- UAS Maintenance/Year				\$10,000

UH Hilo currently runs a subject certificate in UAS and has fleet of 3 UAS. No additional startup software or peripherals will be required for the Aerial Information Technology concentration in the first two years. In the third year the program plans to purchase 1-2 commercial grade UAS with several different types of sensors (~\$80,000). While similar technology does exist on the UH Hilo campus, the existing equipment is paid by and dedicated to research projects and will not be available for teaching. The cost of maintenance is estimated to be approximately \$10,000 per year and will begin in year 4.

Funding from the program will initially rely on tuition revenues with support, if necessary, from the UH Hilo reserves. Projected net revenues (tuition less a 12% contribution to financial aid) from tuition demonstrate that the program will be vibrant if we can recruit 30 students along with 6 students from the community colleges in year three. The total student numbers in the enrollment table also include attrition rates appropriate to UH Hilo. This particular model shows sustained net revenues of about \$250,000 per year, once the program reaches year 4.

Resources/Funding	Year 1 19-20	Year 2 20-21	Year 3 21-22	Year 4 22-23
Tuition/Special Fund Allocation	\$111,000	\$306,434	\$520,881	\$617,554
Budget Shortfall (reserves)	\$110,000	\$0	\$0	\$0

Cost Revenue Projection for B.S. in Aeronautical Sciences



Net Revenue	Year 1 19-20	Year 2 20-21	Year 3 21-22	Year 4 22-23
Net Tuition Revenue	\$111,000	\$306,434	\$520,881	\$617,544
Total Program Cost	\$218,000	\$273,500	\$363,537	\$350,872
Net Revenue	(\$107,000)	\$32,934	\$157,344	\$266,672

We also ran enrollment multiple models to determine the long term viability of the proposed program. Enrollment of a 20 student cohort with 4 community college transfers produces positive revenues of about \$75,000 in year 4. Another model analyzed the results of having 50% of the cohort entering in year three from community colleges, which would significantly reduce UH Hilo revenues. Using a cohort of 24, the program had a net revenue of \$30,000 in year 4, without the 4-6 additional community college students included in the other models. The calculated break even point for this program was a cohort of 17 with 3 community college transfers in year 3. Enrollment numbers less than this will result in an unsustainable program that cannot be brought forward for permanent status.

V. Program Effectiveness

The Program can partially be evaluated by results of students passing the battery of written and skills tests administered by the FAA prior to awarding of licenses and certificates.

Upon BOR approval, the Bachelor of Science Degree in Aeronautical Sciences is also scheduled to go through the most thorough WSCUC (WASC) substantive change review in order to become an accredited program. We have begun this process, but full review is not slated until February or March of 2018. This review is required because of the very different nature of pilot training compared to programs currently offered at the UH Hilo campus. Additionally, we have been working closely with WSCUC to be able to create a clearly documented procedure for transferring and accepting academic credits from non-academically accredited flight providers.

Many other evaluation methods will be used to measure and demonstrate the quality and effectiveness of the proposed program. Evaluation methods include the following:

- Faculty and Course Evaluations
- Academic Program Review
- External Program Review
- Program Accreditation
- Student Retention Rates
- Student Certification Rates
- Student Internship Supervisor Interviews
- Student Graduation Rates
- Student Hiring Rates
- Student Advisory Board
- Community Aeronautical Science Advisory Board
- Alumni Surveys
- Other Student Learning Assessments

VI. Conclusions

The aviation sector, both locally and nationally, is a source of excellent jobs for residents of Hawai'i. The proposed Bachelor of Science of Aeronautical Sciences program is relatively low cost. By combining a student pool of traditional commercial pilots with students pursuing jobs in the emerging field of UAS, delivery is much more efficient. The Aeronautical Sciences degree fits well within other applied science degrees being offered at UH Hilo and can leverage existing UAS research and supporting programs in remote sensing, GIS, robotics, data science, and STEM fields. There is already a high demand for our faculty and students doing emergency

management, rescue, volcano monitoring, tracking forest health, and agricultural monitoring from both government and private businesses just on Hawai'i Island. In the coming years there will be a moderate need for commercial airline pilots, but an ever increasing demand for UAS pilots that are capable in designing, carrying out, and interpreting aerial surveys within and beyond the State of Hawai'i.

UH Hilo

B.S. Aeronautical Sciences

Program Proposal

Appendices

- | | |
|-------------------|---|
| Appendix A | Pathway to Major Airline Employment |
| Appendix B | Unmanned Aerial Systems Research in Progress UH System |
| Appendix C | Letters of Support |

Appendix A

Pathway to Major Airline Employment

Graduate from UH Hilo BSAS Program
Earn: FAA Commercial Multi-Engine Pilot License
200-250 hours of logged flight time



- Immediate Job Opportunities:**
- Certified Flight Instructor
 - First Officer Small Local Airline (Mokulele etc.)
 - First Officer, Corporate Pilot, private jet
 - Small Cargo Pilot
 - Contract Pilot for leased charters
 - Agriculture Pilot, Bush Pilot, Other Aviation Opportunities

Estimated 1-2 years to
build 1500 hours



Hit 1500 logged flight hours
Obtain FAA Airline Transport Certificate



**Apply for a first officer position at a regional,
cargo, or major airline.**

Appendix B

Unmanned Aerial Systems Research in Progress UH System

Project Title	PI	Sponsor
Integrating Herbicide Ballistic Technology with Unmanned Aerial Systems (HBT-UAS) for enhancing Invasive Plant Species Management	James Leary (UHM), Ryan Perroy (UHH), Roberto Rodriguez (UHM)	United States Department of Agriculture
Detecting and Monitoring Rapid Ohia Death and post-infection Forest Processes in Selected Areas on Hawaii Island	Ryan Perroy (UHH)	Hawaii Department of Land and Natural Resources
Develop and Implement Unmanned Aircraft Systems (UAS) Research and Monitoring at Ala Kahakai National Historic Trail and at Pu'uuhonua o Honaunau National Historical Park	Ryan Perroy (UHH)	National Park Service
RAPID: Increasing capacity for data collection during the 2018 East Rift Eruption, Hawaii Island	Ryan Perroy (UHH)	National Science Foundation
Enhance detection and control of invasive plants in Hawai'i Volcanoes National Park	Ryan Perroy (UHH)	National Park Service
A pilot study for agroforestry inventory monitoring in the Marshall Islands using sUAS	Ryan Perroy (UHH)	United States Department of Agriculture
Finding the invasive needle in the imagery haystack via sUAS and computer vision	Ryan Perroy (UHH)	Hawaii Invasive Species Council
Transforming Small Farm Operations with Unmanned Aerial Systems (UAS)	James Leary (UHM), Roberto Rodriguez (UHM)	Maui County
Developing Unmanned Aerial System (UAS) for Small Farm Pest Management Operations	James Leary (UHM), Roberto Rodriguez (UHM)	Hawaii Department of Agriculture
Building Research and Technology Capacity to Support Invasive Plant Species Management	James Leary (UHM), Roberto Rodriguez (UHM)	Hawaii Invasive Species Council
Aerial Surveillance and Control of an Invasive Plant Species in Hawaii's Priority Watershed Forests	James Leary (UHM), Roberto Rodriguez (UHM)	United States Forest Service
Autonomous Control Technology for Unmanned Aerial Systems with Agricultural and Environmental Applications in Central Pacific Islands	Luke Flynn (UHM)	NASA

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Appendix C

Letters of Support

Mokulele Airlines

UHM CTAHR

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October 16, 2018

Dr. Marcia Sakai
Interim Chancellor
University of Hawai'i at Hilo
200 W. Kawili Street
Hilo, HI 96720-4091

RE: Aeronautical Science Program, University of Hawai'i at Hilo

I am writing in strong support of the proposed Bachelor of Science in Aeronautical Science (BSAS). This support comes from many perspectives, including being a 1991 BS graduate of Purdue's Aviation and Transportation Technology program and presently serving as President of Mokulele Airlines.

Aviation is absolutely crucial to the economies of our state and the Asian-Pacific region. It is not only the needs of tourism but also the increasing need for timely transport of commerce and perishable agricultural products. Furthermore, there is an increasing need for pilots due to combined impact of retirements and expanding global operations.

The proposed program will allow Hawai'i students and others from Pacific Islands and Island SE Asia to obtain aviation training and a BSAS that is not present in their countries and unlikely to be offered soon. While, students will likely have to leave the state to complete their senior year FAA certifications with an approved flight training provider it will be a better option for most Hawai'i students than spending 4-yrs in a mainland aviation program and provide them with closer ties to local aviation and aeronautical technology industries. Currently, local students who wish to pursue their dreams of being a commercial airline pilot must study on the mainland where out-of-state and private school tuition is high and usually leaves graduates with massive tuition debt beyond the fees for flight training.

Mokulele Airlines would welcome qualified graduates of the BSAS program into its Second in Command (SIC, First Officer Equivalent) program in an effort to assist in professionally developing the next generation of pilots with interest Hawai'i-based careers. The SIC pilots receive a modest stipend for their services while benefiting from industry training and earning the flight time experience necessary to qualify for a non-restricted Airline Transport Pilot (ATP) license and fly for Mokulele or move on to regional jets. The opportunity to provide a pathway from university to industry for future UH Hilo graduates would be an enormous sense of pride for our airline. It is also important for us to share advice and industry perspectives with the next generation.

I enthusiastically support this program and encourage the State Legislature to provide the requisite staffing and budgetary support. Indeed, it is great opportunity for our island, our state and our region.

Sincerely,

Rob McKinney,
President, Mokulele Airlines

P O Box 4409 Kailua-Kona, Hawai'i 96745
www.mokuleleairlines.com



UNIVERSITY
of HAWAII
MĀNOA

College of Tropical Agriculture and Human Resources
Founding College of the University of Hawai'i
Office of the Dean and Director for Research and Cooperative Extension

October 19, 2018

Marcia Sakai, PhD
Interim Chancellor
University of Hawai'i at Hilo
200 W. Kāwili Street
Hilo, HI 96720-4091

Dear Interim Chancellor Sakai:

Dr. Bruce Mathews asked me to evaluate your university's desire to develop a pilot and unmanned aerial vehicle program. As a past private pilot, when my medical certificate was current, I appreciate the work and skill it takes to become a private pilot and go beyond that license.

As the Dean of the College of Tropical Agriculture and Human Resources (CTAHR) at the University of Hawai'i at Mānoa, I can look at CTAHR's programs and determine if there is any overlap or conflict. I can tell you that this program would in no way interfere, conflict or cause any level of consternation to CTAHR's plans and future expectations.

Several faculty members in CTAHR use drones in their research, so if students with drone skills wished to go onto graduate school, there may be limited opportunities to continue their studies at the graduate level in those programs.

Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in black ink that reads 'NB Comerford'.

Nicholas Comerford, PhD
Dean and Director for Research and Cooperative Extension

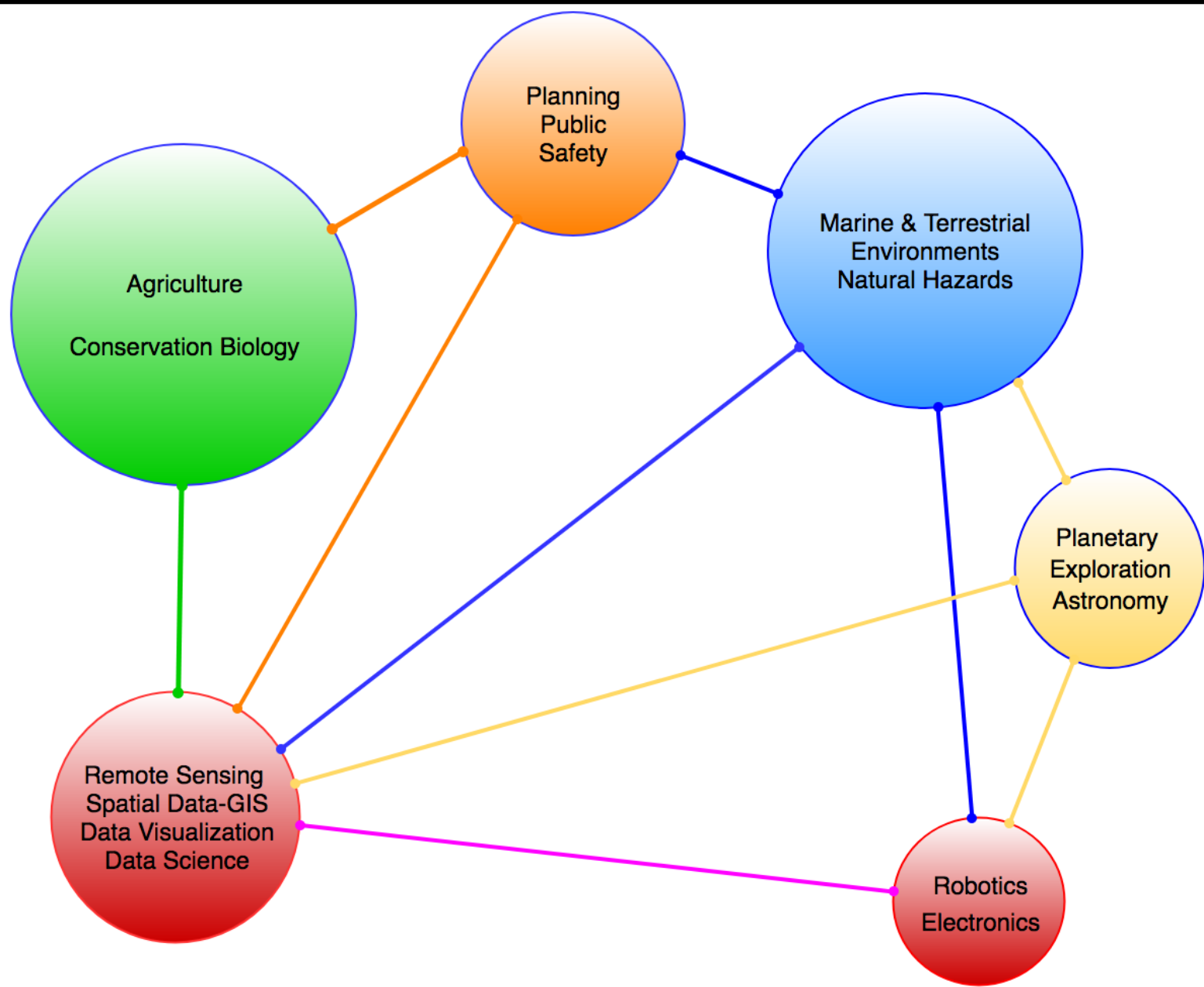
c: Bruce Mathews, College of Agriculture, Forestry and Natural Resources
Management, University of Hawai'i at Hilo
Michael Bruno, Office of the Vice Chancellor for Academic Affairs, University of
Hawai'i at Mānoa

3050 Maile Way, Gilmore Hall 202 Honolulu, Hawai'i 96822-2271
Telephone: (808) 956-8234, Fax: (808) 956-9105
E-mail: dean@ctahr.hawaii.edu

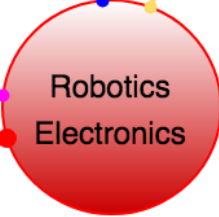
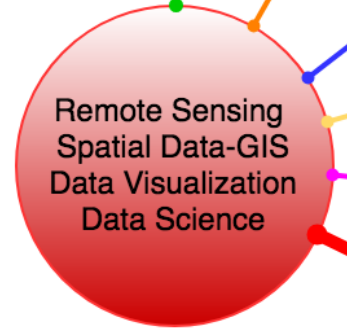
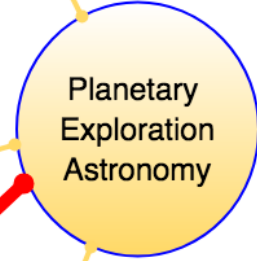
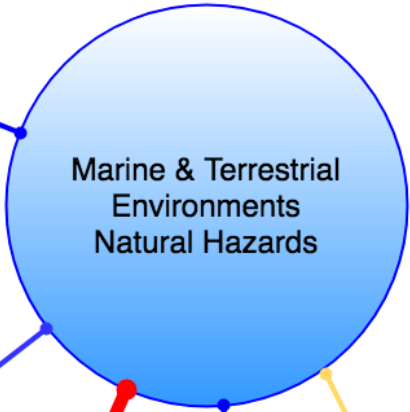
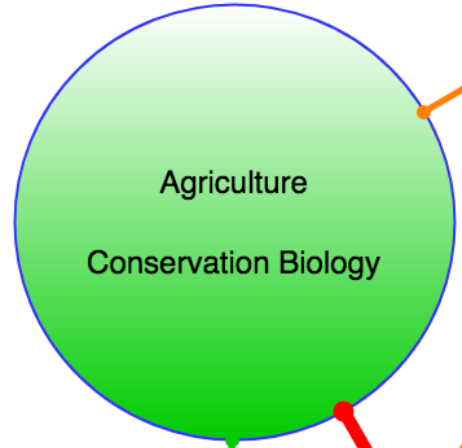
An Equal Opportunity/Affirmative Action Institution

UH Hilo Strength in applied STEM fields

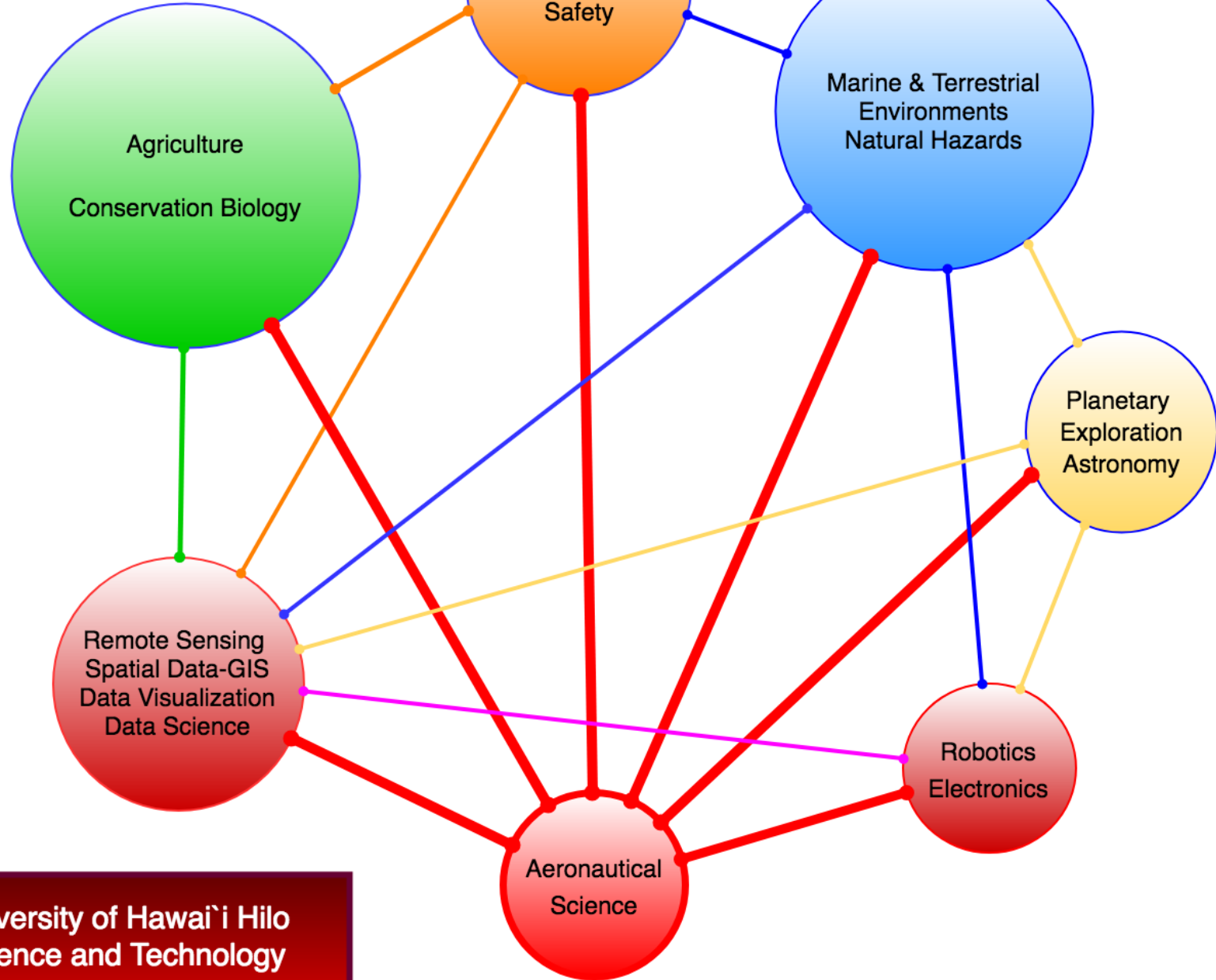
Toward a 21st Century Technology Hub



University of Hawai'i Hilo
Science and Technology



University of Hawai'i Hilo
Science and Technology





UH HILO DRONE TEAM
Students & staff in the field at recent lava flow