

January 31, 2013

RE: HB 725 Relating to Higher Education

To the Honorable Chairman Issac Choy, Vice Chairwoman Linda Ichiyama and Members of the Committee on Higher Education:

I support the above bill in providing the implementation of a professional pilot training program, which includes the training for drone (unmanned) aircraft systems. According to the recent news, the drone success in Syria and other areas of the world means an expected demand for pilots skilled in such systems. Thus, it is appropriate at this time to have such training and educational opportunities available here in Hilo.

Over 40 years ago, our kupuna was able to foresee the huge economic impact to Hawaii Island that the creation of setting aside Mauna Kea for telescopes had. The current bill sponsors are forecasting that the creation of an aviation training facility is a step towards an environmentally -friendly industry in the 21st century for Hawaii Island.

I urge you to pass HB 725 because it not only creates an educational opportunity for the people, but also creates jobs when students from across the country, come into Hilo to learn and train.

Joy A. San Buenaventura

University of Hawai'i at Mānoa

Hawai'i Space Grant Consortium

Hawai'i Institute of Geophysics and Planetology
School of Ocean and Earth Science and Technology
1680 East-West Road POST 501, Honolulu, HI 96822

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Ms. Marcia Rei Sistoso

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Ms. Dora Nakafuji
Hawaiian Electric Company

Mr. Stewart Burley
Strategic Theories Unlimited LLC/
Kauai Liaison

January 31, 2013

Testimony in support of H.B. 725

As the Director of the Hawai'i Space Grant Consortium, chartered under the National Space Grant College and Fellowship program, I write to request support of House Bill 725. Space Grant (representing 52 consortia) operates successfully in all states plus the District of Columbia and Puerto Rico and is committed to identifying, supporting, and preparing a skilled workforce that can serve NASA and the nation.

For over 25 years, Space Grant has been extremely successful in inspiring, recognizing, educating, and sustaining students and faculty involved in NASA and STEM-related education and research. Not only does Space Grant attract students to STEM areas, but through fellowships and other support mechanisms it provides them with a strong foundation in learning, many involving hands-on projects, that lead to career opportunities. Our central goal is to provide a wide range of activities that help develop a high-tech workforce in Hawai'i.

House Bill 725 will provide the vehicle and the resources the state of Hawai'i lack in flight and aviation. It will increase STEM opportunities and greatly enhance workforce development in all areas of aviation and aeronautics. H.B. 725 will also increase the need for a course in aviation within the University of Hawai'i system to ensure that our state supports students who want to pursue advanced degrees in aerospace, earth science, space science, and other science and engineering fields. This will help pave the way for the next generation of explorers and allow for an increase in our local science and engineering workforce.

House Bill 725 can be instrumental in opening the door to a high-technology future in Hawai'i. A trained workforce is essential for future economic development, not only in the important fields of aviation and aeronautics it is aimed at, but in all technology fields. I strongly support passage of HR 725. Thank you for your consideration.

Luke Flynn
Director, Hawaii Space Grant Consortium
Director, Hawaii Space Flight Laboratory

999 Wilder Avenue
Apartment 1203
Honolulu, HI 96822

Sheldon S.H. Zane

LATE TESTIMONY

ph. (808) 664-0903
cell (808) 349-1984
shel@zanedevelopment.com

January 30, 2013

Re: Testimony In Favor of H.B. No. 725

Honorable Chair and Committee Members of the House Transportation Committee

I speak in favor of H.B. 725 for an International Flight Training Center in Hilo, Hawaii. As someone born and raised in Hilo, during my teen years, I was actively involved in aviation participating in a Air Explorer Scout Squadron and the Civil Air Patrol. I am a private pilot and several years ago took an intensive course in IFR (Instrument Flight Rules) at the Hilo International Airport and obtained my IFR Certification. I found the situation in Hilo ideal for instrument flight training for the conditions mentioned in HB. 725, namely, the weather conditions, light use of the airport and air space and a excellent communication and control services from the manned flight tower.

Several years ago, I testified for such improvements at the Hilo Airport and during public testimony and was apprehensive when a young girl and a resident of Keaukaha (adjoining property) rose to testify. However, her testimony stated she was a student at Kamaehamaeha Schools and was interested in becoming a pilot and was in favor of added facilities at the Hilo Airport.

Support of H.B. 725 would stimulate the economy of Hawaii and the Big Island in particular. It would be a non-polluting industry and bring high paid jobs to the Big Island and create a demand for temporary housing.

For the above stated reasons, I support H.B. 725 and the concept of a Flight Training Retraining and Aeronautical Programs in Hilo. I suggest that because there are similar UH programs at Kaleloa Airport offered by Honolulu Community College, rather than starting a new responsibility and organization with Hawaii Community College and University of Hawaii Hilo, consideration be given to having the existing aeronautical programs by Honolulu community College oversee the Hilo Initiative for Flight and Aeronautics Training.

Respectfully submitted,



Sheldon Zane

LATE TESTIMONY

ichiyama3 - Malia

From: mailinglist@capitol.hawaii.gov
Sent: Thursday, January 31, 2013 11:59 AM
To: HEDtestimony
Cc: weldinsheldon@hawaii.rr.com
Subject: *Submitted testimony for HB725 on Jan 31, 2013 14:00PM*

HB725

Submitted on: 1/31/2013

Testimony for HED on Jan 31, 2013 14:00PM in Conference Room 309

Submitted By	Organization	Testifier Position	Present at Hearing
sheldon lehman	Individual	Support	No

Comments:

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

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From: mailinglist@capitol.hawaii.gov
Sent: Thursday, January 31, 2013 11:43 AM
To: HEDtestimony
Cc: HLHaymore@earthlink.net
Subject: *Submitted testimony for HB725 on Jan 31, 2013 14:00PM*

HB725

Submitted on: 1/31/2013

Testimony for HED on Jan 31, 2013 14:00PM in Conference Room 309

Submitted By	Organization	Testifier Position	Present at Hearing
Marilyn Haymore	Individual	Support	No

Comments:

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

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LATE TESTIMONY

Testimony Presented Before the House Committee on Higher Education

on

January 31st 2013

by

Solomon P. Ka`awaloa, Jr.

HB 725 Relating to Higher Education

Appropriating \$350,000 to the University of Hawai'i at Hilo for the study of an aviation training program at Hawaii Community College and the University of Hawai'i at Hilo and construction of an International Aviation Training Center at the Hilo International Airport.

The Honorable Chairman Isaac Choy, Vice Chairwoman Linda Ichiyama & Members of the Committee on Higher Education

Aloha!

The details of HB 725 lie within its reports and proposals, but the importance for of HB 725 already exists among our children, educators, and the aviation industry. More importantly, many future career opportunities for our children will "STEM" from a program such as this. As a fellow Hawaiian born and raised in Hawai'i, a strong supporter of continued and higher education opportunities for the people of Hawai'i, and an aviation educator for the last 12 years, I believe that Hawai'i has lacked a program of this caliber and size. In addition, I believe that a well-supported program such as this will effectively meet the demands of a professional aviation training center, as well as the upcoming aviation industry needs on a global scale. Furthermore, Hawai'i is a premier location for aviation education and training due to its economic contributions to the international parts of the aviation industry.

Without a doubt, I support House Bill 725 and strongly urge its passage by the Hawai'i State Legislature.

Thank you for the opportunity to support this bill

Sincerely,

Solomon P. Ka`awaloa, Jr.
Prescott, AZ

From: mailinglist@capitol.hawaii.gov
Sent: Thursday, January 31, 2013 11:14 AM
To: HEDtestimony
Cc: hawaiiijm@yahoo.com
Subject: Submitted testimony for HB725 on Jan 31, 2013 14:00PM
Attachments: HB 725.docx

HB725

Submitted on: 1/31/2013

Testimony for HED on Jan 31, 2013 14:00PM in Conference Room 309

Submitted By	Organization	Testifier Position	Present at Hearing
William	President, EAA Hilo Chapter 1182	Support	No

Comments: Testimony Presented Before the House Committee on Higher Education On January 31st 2013 By William J. Phillips Jr. (President Expermental Aircraft Association Hilo Chapter 1182, Representative ; Hilo International Airport Aircraft Owners and Pilot Asociation Representative; Major, USAF Retired; Hilo property owner and resident since 1978; Owner, pilot of two aircraft, one based at Hilo.; Civil Air Patrol , CAP mission pilot, (I flew as pilot in command of the 2012 night Tsunami warning mission.) Regarding; HB 725! Relating to Higher Education Appropriating \$350,000 to the University of Hawai 'i at Hilo for the study of an aviation training program at Hawaii Community College and the University of Hawai 'i at Hilo and construction of an International Aviation Training Center at the Hilo International Airport. To; The Honorable Chairman Issac Choy, Vice Chairwoman Linda Ichiyama & Members ofthe Committee on Higher Education. I think that the study may find that the aviation training program may also use the Kailua-Kona Airport in lieu of the Hilo Airport! I support House Bill 725 and strongly urge its passage by the Hawai 'i State Legislature. The proposed aviation program will assist in the diversification of the state 's economy and provide an opportunity to gain a reputation as a world class aviation training center servicing the Pacific Rim and beyond. It will catalyze a child 's interest in science, technology, engineering and math (STEM) and inspire the next generation of scientists and engineers. I strongly urge its passage by your committee. Thank you for the opportunity to support this bill. William J. Phillips Jr. Hilo, Hawaii

Please note that testimony submitted less than 24 hours prior to the hearing , improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

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HB 725

Status

RELATING TO HIGHER EDUCATION.

Appropriates \$350,000 to the University of Hawaii to hire a program coordinator and a technical support staff member for the proposed international flight training center and associated degree programs at the University of Hawaii at Hilo and Hawaii community college.

HED, FIN

HOUSE OF REPRESENTATIVES
TWENTY-SEVENTH LEGISLATURE, 2013
STATE OF HAWAII

A BILL FOR AN ACT

RELATING TO HIGHER EDUCATION.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

1 SECTION 1. Pursuant to Senate Concurrent Resolution No.
2 156, S.D. 1, adopted during the regular session of 2012, the
3 legislature urged the creation of an exploratory committee to
4 consider the establishment of an international flight training
5 center and associated aeronautical training programs at Hawaii
6 community college and the University of Hawaii at Hilo. Tasked
7 with submitting a report to the legislature, the exploratory
8 committee recommended the establishment of three programs and
9 that the legislature appropriate funds to hire a program
10 coordinator and a technical support staff member, contracted
11 through the University of Hawaii, who will conduct and draft the
12 necessary planning and studies required for the proposed
13 programs. The proposed professional helicopter pilot program
14 and the proposed professional unmanned aircraft systems pilot
15 program are to be administered through Hawaii community college.
16 The proposed Professional Airplane Pilot Program is to be
17 administered by the University of Hawaii at Rib.
2013-0499 RB SMA-I.doc

H.B. NO. 1Th

1 The program coordinator and technical support staff member
2 will work in conjunction with the chancellors of Hawaii
3 community college and the University of Hawaii at Hilo, the
4 exploratory committee, and the Rib community to complete the
5 necessary studies and planning for the programs' future
6 implementation.
7 The purpose of this Act is to appropriate funds for the
8 program coordinator and technical support staff member, as
9 recommended by the exploratory committee.
10 SECTION 2. There is appropriated out of the general
11 revenues of the State of Hawaii the sum of \$350,000 or so much
12 thereof as may be necessary for fiscal year 2013-2014 and the

13 same sum or so much thereof as may be necessary for fiscal year
14 2014-2015 for a program coordinator and a technical support
15 staff member to complete the necessary planning and studies
16 required for an international flight training center and
17 associated proposed aeronautical training programs at Hawaii
18 community college and the University of Hawaii at Hilo.
19 The sums appropriated shall be expended by the University
20 of Hawaii for the purposes of this Act.

21

2013-0499 FIB SMA-1.doc

Page 3 **H.B. NO. 1~5**

1

2

SECTION 3. This Act shall take effect on July 1, 2013.

INTRODUCED BY:

-w

2013-0499 HB SMA-1.doc

JAN 22 2013

H.B. NO. 13-S

Report Title:

Appropriation; International Flight Training Center;
Aeronautical Training Programs; University of Hawaii

Description:

Appropriates \$350,000 to the University of Hawaii to hire a
program coordinator and a technical support staff member for the
proposed international flight training center and associated
degree programs at the University of Hawaii at Hilo and Hawaii
community college.

The summary description of legislation appearing on this page is for informational purposes only
and is

not legislation or evidence of legislative intent.

2013-0499 HB SMA-1.doc

Testimony Presented Before the House Committee on Higher Education
on

January 31st 2013

by

John Doe

HB 725! Relating to Higher Education

!! Appropriating \$350,000 to the University of Hawaii i at Hilo for the study

!! of an aviation training program at Hawaii Community College and the

!! University of Hawai i at Hilo and construction of an International Aviation

!! Training Center at the Hilo International Airport.

!!

The Honorable Chairman Issac Choy, Vice Chairwoman Linda Ichiyama & Members of the Committee on Higher Education

Aloha!

I support House Bill 725 and strongly urge its passage by the Hawai i State Legislature.

The goal of HB 725 is to develop a state-of-the-art collegiate-level aviation training program which includes aircraft, pilot training, simulation and airspace integration. It seeks to address the State s needs for a workforce trained for high priority science and technology fields. The proposed aviation program will assist in the diversification of the state s economy and provide an opportunity to gain a reputation as a world class aviation training center servicing the Pacific Rim and beyond. It will catalyze a child s interest in science, technology, engineering and math (STEM) and inspire the next generation of scientists and engineers.

I strongly urge its passage by your committee.

Thank you for the opportunity to support this bill.

John Doe

Hilo, Hawaii

1

A Report to the 2013 Legislature

In Response to HCR107/SCR156 SD1

HCR107/SCR156 SD1 request that the Governor convene a ten-member exploratory committee with two members each representing 1) the University of Hawai i at Hilo, 2) the Hawai i Community College, 3) the Department of Transportation Hilo Airport Division, 4) the Hawai i County Office of Research and Development and 5) the Hawai i aviation community, who will provide the technical expertise on aviation in Hawai i and implementation of the program and be selected from a list of Federal Aviation Administration licensed Part 121 commercial aviation pilots that hold a current airline transport type rating, fly class one medical, and operate aircrafts in Hawai i. This exploratory committee is requested to examine the feasibility and necessary resources of establishing an international aviation training center at the Hilo International Airport and an advanced aviation degree training program at the University of Hawai i at Hilo and to report its findings and recommendations, including any budget requests and proposed legislation.

Introduction

This report consists of two parts: 1) a summary of efforts to examine the future of aeronautics and 2) a report on the findings and recommendations of the aviation exploratory committee convened by the Governor in the summer of 2012.

Background Summary

The University of Hawai i (UH) strategic plan goals are articulated with the higher education and workforce needs of the state in the University of Hawai i System Strategic Outcomes and Performance Measures, 2008-2015. One of these measures is to increase degrees in science, technology, engineering and math (STEM) fields. In order to stimulate high tech and high wage economic sectors for the state and its citizens, the State of

Hawaii is on record at the executive level, the legislative level, and the university level arguing for the need to invest in STEM education and economics. One crucial area of opportunity that fits in all of these areas is aeronautics. Hawaii is already deeply invested in moving forward in attempting to grow an aerospace and aeronautics sector. In 2013, a team of University of Hawaii electrical and mechanical engineering students will be the first in the nation to launch its student built satellite by NASA. On Hawaii Island, Mauna Kea will host the largest telescope in the world at the Thirty Meter Observatory. Aeronautics is a baseline building block of studies and knowledge for these and others. In addition, aviation (fixed wing and rotary) are crucial forms of transportation for this ocean state. Aeronautics not only supports these other aerospace knowledge suites, it is a hub for other crucial STEM programs such as meteorology, safety science, engineering, avionics, and others. Aviation is an applied STEM program that will draw many young students to these educational areas. Additional aeronautical curriculum offerings would allow the University of Hawaii system to excel in applied and basic science, technology, engineering and mathematics fields that would provide the essential aeronautical training curriculum for its graduates to be competitive in the global aviation industry. 2

Findings

The aviation exploratory committee was tasked with conducting an assessment to identify relevant needs in the global aeronautical spectrum. Findings from this assessment are as follows:

Pilot Demand

There was an overall consensus by the committee that the aviation industry as a whole is facing a global pilot shortage in the near future. Over the next 20 years, passenger travel demand will grow annually at 5.0% and cargo will grow at 5.8% with emerging markets in the Asia-Pacific region leading the way. In order to meet the demand due to retirements and attrition, 19,000 pilots need to be trained annually. Currently, there are 12,000 pilots being trained at all US flight schools and aviation university programs. Boeing, the largest aircraft maker in the world, projects 466,650 pilots and 596,000 maintenance mechanics will need to be trained by 2030. Boeing and Airbus base these numbers on 30,000 new aircraft orders as the aging worldwide aircraft fleet is retired. In addition, the entry of Unmanned Aircraft Systems (UAS) into the civilian aviation flight structure by 2015 will add to the increased demand for pilots further increasing the projected pilot shortage. In Hawaii, hundreds of students attend mainland aviation programs accounting for millions of dollars in revenue leaving the State. The primary reason for this is the required level of academic and practical flight training in the aeronautical field is non-existent in Hawaii. In the fall of 2013 the FAA is expected to increase the flying hour requirements and level of training for pilots flying in Part 121 operations which encompass all major US airlines. These increased standards will no doubt increase the safety of US passenger operations but will make it more difficult for a pilot to attain their Airline Transport Certificate (ATP) requiring more flight hours and advanced training. The baseline standard at major US airlines today, to include Hawaii based Hawaiian Airlines, prefer applicants who have attained a baccalaureate (4 year) degree, airline transport certificate (ATP), received their primary training either from an accredited institution or the military and have a significant number of flight hours. Currently there are no programs in the State of Hawaii that can prepare a student for this high level of qualification. In addition, Hawaii, which has the best strategic geographical location to Asia, is best poised to benefit from the Asia-Pacific market if Hawaii had a world class aviation program.

Location

Hilo, Hawaii provides the perfect environment for a world class international aviation training center. Hilo's unique meteorological conditions, underutilized land at Hilo International Airport, low air traffic activity, active air controller and radar facilities, excellent instrument training and convenient location of the airport to Hawaii Community College (HawCC) and UH-Hilo (UHH) is ideal. In addition, Hilo offers relatively inexpensive housing and a local culture that is compatible with many Asia-Pacific international students who would be attracted to the program. As mentioned before, UH Hilo's Astronomy program and its associated Imiloa Astronomy Center, world class telescopes on Mauna Kea and the future UH-Hilo Department of Engineering would all complement the aviation training center and associated programs outlined below. 3

Recommendations

The exploratory committee is recommending that the Chancellors of the University of Hawai'i at Hilo and Hawai'i Community College reconstitute an aviation exploratory committee upon the final report being submitted to the legislature and governor to further its research into the proposed aeronautical program. Utilizing a 2+2+2 base model for the International Aviation Training Program the committee's recommendations are as follows:

Proposed Aeronautical Training Programs at Hawai'i Community College and UH-Hilo

1. Professional Helicopter Pilot- Associates of Applied Science (Hawaii Community College)

(*See appendix A1)

2. Professional UAS Pilot- Associates of Applied Science (Hawai'i Community College)

(*See appendix A2)

3. Professional Airplane Pilot- Bachelors of Science (University of Hawai'i at Hilo)

(*See appendix A3)

Proposed International Aviation Training Center at Hilo Airport

4. (*See appendix A4)

Future Related Aeronautical STEM & Advanced Degrees at Hawai'i Community College and UH-Hilo

5. Hawai'i Community College AAS in Aerospace Operations

Avionics/UAV Electronics (Integrate with marine radio and electronic instrumentation

Flight dispatch / Flight Service Specialist / Meteorologist

Air Traffic Control

Space Launch & Control

Aviation Business Administration

6. University of Hawai'i at Hilo BS in Aerospace Operations Management -Three specialties within the degree:

Flight Operations Management (Flight Dispatch, Flight Service Specialist, Meteorologist, Air Traffic Control, Space Launch & Control)

Maintenance Management (Airframe & Power plant, Avionics, UAV Electronics)

Management & Logistics (Aviation Business Administration & Aviation Safety)

7. University of Hawai'i at Hilo Potential Advanced Aeronautical Degree Programs (MAS)

Master of Aeronautical Science

Master of Science in Aeronautics

Master of Science in Aerospace Engineering

Master of Science in Aviation Management

Master of Business Administration in Aviation Management (MBA-A)

Proposed Legislative Funding for Fiscal Year 2013

8. The committee recommends that the 27th Hawaii State Legislature appropriate \$350,000 for the hiring of a Program Coordinator (1) and an APT Support Staff (1) who will begin in the Spring of 2014, a Feasibility Study, an Economic Impact Study, and a draft Authorization To Plan (ATP) for each of the proposed degree programs and associated campuses which will be submitted to the University of Hawaii Council of Chief Academic Officers (CCAO) for review. In addition, the program coordinator will draft a complete program proposal for each of the programs which will describe the programs in detail. The program coordinator will work in conjunction with the exploratory committee and the Hilo community to complete the necessary studies and planning.

Proposed Implementation Schedule

9. Assuming future resources are provided, the following proposed implementation schedule is recommended:

- A. Aviation committees report submitted - Spring 2013
- B. 27th Legislature Appropriation - Fiscal year 2013 Budget (\$350,000)
- C. Program Coordinator & Staff on Contract - Spring 2014 to Spring 2015
- D. Authorization to plan & program proposal, economic/feasibility studies completed- Spring 2015
- E. Program plan finalization & Board of Regents review & final approval - Spring 2016
- F. Interim facilities completed - Fall 2016
- G. Faculty hired - Fall 2016
- H. Inaugural class enrolled - Spring 2017

Signed,

Hawaii Aviation Exploratory Committee

Dr. Ken Morris

Dr. Bruce Mathews

Noreen Yamane

Joyce Hamasaki

Steve Santiago

Henry Bruckner

Elizabeth Dykstra

Jane Horike

Bo Masuyama

Kaiali Kahele 5

**APPENDIX A1: Draft Curriculum: Professional Helicopter Pilot- AAS (HawCC)
CURRICULUM (60 total credits)**

Credits: Course Title/Description:

15 15 General Education courses

4 Private Pilot Helicopter Ground Fundamentals of aerodynamics, helicopter operation and performance, and instruments. Fundamentals of navigation, human errors, Federal Aviation Administration (FAA) requirements, weather systems and hazards.

5 Private Pilot Helicopter Flight Fundamentals of basic helicopter operations. Includes one-on-one supervised cross-country flights. Flight training including supervised and solo cross-country flights and intermediate operations. Preparation for FAA private pilot helicopter oral and practical exam.

4 Instrument Pilot Helicopter Ground Instrument navigation, Instrument Flight Rule (IFR) traffic system and procedures, dead reckoning, IFR Radio navigation, use of various instrumentation systems, IFR charts, weather reports and forecasts, transponders, radars, radio aids, anti-icing/deicing systems, preflight checks, aeronautical decision making.

5 Instrument Pilot Helicopter Flight Flight by reference to instruments. Emphasis on instrument preflight, navigation, approach, emergency, and post-flight procedures. Includes the combination of a FAA approved flight-training device simulator and actual flight time in preparation for FAA instrument pilot helicopter oral and practical test.

3 Commercial Pilot Helicopter Ground Designed for students who are both private pilot and instrument flight rated for helicopter flight and are seeking the commercial pilot rating. Includes advanced helicopter components, advanced aerodynamics and advanced performance. Includes advanced helicopter components, cross country flight, and commercial FAA regulations.

6 Commercial Pilot Helicopter Flight Advanced helicopter flight operations and navigation, including mountain flying techniques. Preparation for FAA commercial pilot oral and practical test.

3 Flight Instructor Helicopter Ground Instructional strategies and planning, communications, student evaluation, the learning process and flight instructor responsibilities.

4 Flight Instructor Helicopter Flight Techniques for giving one-on-one instruction to helicopter student pilots and critiquing student performance. Preparation for FAA flight instructor helicopter oral and practical test. 6

Light Instructor Instrument Helicopter Ground Instrument pilot teaching techniques utilizing Instrument Flight Rules (IFR) regulatory guidelines. Preparation to take FAA flight instructor instrument helicopter written test and a portion of the oral and practical exam.

Light Instructor Instrument Helicopter Flight Teaching flying in clouds and poor weather solely by reference to aircraft instruments. Includes teaching in a flight-training device (simulator). Preparation for FAA flight instructor instrument helicopter and oral practical test.

Helicopter Pilot Preventative Maintenance Basic helicopter maintenance theory, documentation, and standard industry practices to return an aircraft to service in accordance with the FAA standards. Emphasis on maintenance tasks that pilots are authorized to perform on helicopters.

2 Helicopter 135 Tour Operations Rules, operating limitations, and procedures for FAA Part 135 helicopter operations. Emphasis placed on helicopter tour flying techniques in Hawaii. i. Compliance, safety, and procedures for professional helicopter pilots flying 135 operations.

1 Career Planning and Preparation A course in which students will discuss and develop short-term and long-term job and career goals, conduct career research using various University and industry resources, prepare a personal job search portfolio, prepare resumes and letters of application, and gain insights and proficiency in interviewing skills so they are better prepared to enter the job market upon graduation. Students will participate in simulated interview scenarios, will be expected to correspond with at least one company, and will be involved in the evaluation of letters, resumes, and interviews.

3 Industry Internship Designed to combine classroom theory with practical application through job-related experiences. Students are actively employed in aviation business, industry, government, and a variety of organizations and agencies with a work focus which relates to their academic training and career objectives. 7

**APPENDIX A1: Draft Cost Structure: Professional Helicopter Pilot- AAS (HawCC)
2014/2015 Tuition**

- In-State \$1,212 per term for 4 terms = \$4,848 Total
- Out-of-State \$3,552 per term for 4 terms = \$14,208 Total

Flight Lab Fees

- \$130,900 Total for all courses (using the Robinson R22)
- \$183,200 Total for all courses (using the Robinson R44*)

* Safety Consideration - any person over 200 pounds must fly the R44

Certificates Earned:

- Private Pilot
- Instrument Rating
- Commercial Pilot Single-Engine
- Flight Instructor
- Flight Instructor – Instrument

Total Degree Cost (Tuition & Flight Fees)

In-State Tuition

- \$135,748 in the R22 (\$67,874 per year)
- \$188,048 in the R44 (\$94,024 per year)

Out-of-State Tuition

- \$145,108 in the R22 (\$72,554 per year)
- \$197,408 in the R44 (\$98,704 per year)

APPENDIX A2: Draft Curriculum: Professional UAS Pilot- AAS (HawCC)

CURRICULUM (60 total credits)

Credits: Course Title/Description:

15 15 General Education courses

4 Private Pilot Airplane Ground Fundamentals of aerodynamics, airplane operation and performance, and instruments. Fundamentals of navigation, human errors, FAA requirements, weather systems and hazards.

5 Private Pilot Airplane Flight Fundamentals of basic airplane operations. Includes one-on-one supervised flights. Flight training including supervised and solo cross-country flights and intermediate operations. Preparation for FAA private pilot airplane oral and practical exam.

4 Instrument Pilot Airplane Ground Instrument navigation, Instrument Flight Rule (IFR) traffic system procedures, dead reckoning, IFR Radio navigation, use of various instrumentation systems, IFR charts, weather reports and forecasts, transponders, radars, radio aids, anti-icing/deicing systems, preflight checks, aeronautical decision making.

5 Instrument Pilot Airplane Flight Flight by reference to instruments. Emphasis on instrument preflight, navigation, approach, emergency, and post-flight procedures. Includes the combination of a FAA approved flight-training device simulator and/or actual flight time in preparation for the FAA instrument pilot airplane oral and practical test.

3 Commercial Pilot Airplane Single Engine Ground Designed for students who are both private pilot and instrument flight rated for airplane flight and are seeking the commercial pilot single engine rating. Includes advanced airplane components, advanced aerodynamics and advanced performance.

6 Commercial Pilot Airplane Single Engine Flight Advanced airplane flight operations and navigation including mountain flying techniques. Preparation for FAA commercial pilot single engine oral and practical test. 9

2 UAS Operations Fundamentals of Unmanned Aircraft System (UAS) Operation. Includes concept of operations, types of systems, applications, and optionally piloted vehicles.

2 UAS Aircraft and Ground Systems Fundamentals of UAS Aircraft and ground systems. Includes basic component operation and use of airframe systems, the power plant, flight controls, and avionics.

2 UAS Communications, Telemetry, and Sensors Essentials of UAS communication, telemetry, and sensor systems. Includes basic component operation and use of transmitters, computer control systems, and sensor packages. Single and multiple point failure modes, electromagnetic interference, and satellite communication theory are reviewed.

2 UAS Human Machine Interface Fundamentals of UAS Human-Machine Interface. Includes UAS crew coordination, human factors, ergonomics, and factors impacting control and operation.

3 UAS Fixed-Wing Flight Fundamentals of UAS Fixed-Wing Flight. Designed for the commercial and instrument rated pilot to safely operate fixed-wing UAS. Demonstrate judgment and consistent safe flying techniques especially during takeoff and landing.

3 UAS Rotor-Wing Flight Fundamentals of UAS Rotor-Wing Flight. Designed for the commercial and instrument rated pilot to safely operate rotor-wing UAS. Demonstrate judgment and consistent safe flying techniques especially during takeoff and landing.

1 Career Planning and Preparation A course in which students will discuss and develop short-term and long-term job and career goals, conduct career research using various university and industry resources, prepare a personal job search portfolio, prepare resumes and letters of application, and gain insights and proficiency in interviewing skills so they are better prepared to enter the job market upon graduation. Students will participate in simulated interview scenarios, will be expected to correspond with at least one company, and will be involved in the evaluation of letters, resumes, and interviews.

3 Industry Internship Designed to combine classroom theory with practical application through job-related experiences. Students are actively employed in aviation business, industry, government, and a variety of organizations and agencies with a work focus which relates to their academic training and career objectives. 10

**APPENDIX A2: Draft Cost Structure: Professional UAS Pilot- AAS (HawCC)
2014/2015 Tuition**

- In-State \$1,212 per term for 4 terms = \$4,848 Total
- Out-of-State \$3,552 per term for 4 terms = \$14,208 Total

Flight Lab Fees

- \$147,700 Total for all airplane courses in a Technologically Advanced Airplane (TAA) and

all UAV flight courses

- \$101,300 Total for all airplane courses in a traditional primary trainer and

all UAV flight courses

Certificates Earned:

Private Pilot

Instrument Rating

Commercial Pilot Single-Engine

Note: Currently, the FAA requires only a Commercial Single-Engine Certificate with Instrument Rating to be a UAV pilot. Students become "qualified" on both fixed-wing and on rotary-wing UAVs.

Total Degree Cost (Tuition & Flight Fees)

In-State Tuition

- \$152,548 (\$76,274 per year) in a TAA
- \$106,148 (\$53,074 per year) in a traditional primary trainer

Out-of-State Tuition

- \$161,908 (\$80,954 per year) in a TAA
- \$115,508 (\$57,754 per year) in a traditional primary trainer

**NDIX A3: Draft Curriculum: Professional Airplane Pilot- BS (UHH)
CURRICULUM (120 total credits)**

Units: Course Title / Description:

General Education Courses

Private Pilot Airplane Ground Fundamentals of aerodynamics, airplane operation and performance, and instruments. Fundamentals of navigation, human errors, FAA requirements, weather systems and hazards.

Private Pilot Airplane Flight Fundamentals of basic airplane operations. Includes one-on-one supervised flights. Flight training including supervised and solo cross-country flights and intermediate operations. Preparation for FAA private pilot airplane oral and practical exam.

4 Instrument Pilot Airplane Ground Instrument navigation, Instrument Flight Rule (IFR) traffic system procedures, dead reckoning, IFR Radio navigation, use of various instrumentation systems, IFR charts, weather reports and forecasts, transponders, radars, radio aids, anti-icing/deicing systems, preflight checks, aeronautical decision making.

5 Instrument Pilot Airplane Flight Flight by reference to instruments. Emphasis on instrument preflight, navigation, approach, emergency, and post-flight procedures. Includes the combination of a FAA approved flight-training device simulator and/or actual flight time in preparation for the FAA instrument pilot airplane oral and practical test.

3 Commercial Pilot Airplane Single Engine Ground Designed for students who are both private pilot and instrument flight rated for airplane flight and are seeking the commercial pilot single engine rating. Includes advanced airplane components, advanced aerodynamics and advanced performance.

6 Commercial Pilot Airplane Single Engine Flight Advanced airplane flight operations and navigation including mountain flying techniques. Preparation for FAA commercial pilot single engine oral and practical test.

1 Commercial Pilot Airplane Multiengine Ground Designed for students who are both instrument and commercial single-engine rated for airplane and are seeking the commercial multiengine pilot certificate. Includes advanced airplane components and multiengine theory and procedures.

1 Commercial Pilot Airplane Multiengine Flight Advanced multiengine airplane flight

operations. Preparation for FAA commercial pilot oral and practical test.

3 Flight Instructor Airplane Ground Instructional strategies and planning, communications, student evaluation, the learning process and flight instructor responsibilities.

4 Flight Instructor Airplane Flight Techniques for giving one-on-one instruction to airplane student pilots and critiquing student performance. Preparation for FAA flight instructor airplane oral and practical examinations.

2 Flight Instructor Instrument Airplane Ground Instrument pilot teaching techniques utilizing Instrument Flight Rules (IFR) regulatory guidelines. Preparation to take the FAA flight instrument instructor written test and a portion of the oral and practical exam.

2 Flight Instructor Instrument Airplane Flight Teaching flying in clouds and poor weather solely by reference to aircraft instruments. Includes teaching in a flight-training device (simulator). Preparation for FAA flight instructor instrument airplane oral and practical test.

1 Airplane Pilot Preventative Maintenance Basic airplane maintenance theory, documentation, and standard industry practices to return an aircraft to service in accordance with FAA standards. Emphasis on maintenance tasks that pilots are authorized to perform on airplanes.

3 Aviation Safety Designed to develop a knowledge of contributing factors affecting aviation safety and fostering control methods and techniques to reduce accidents related to aircraft and the aviation field.

2 Aero Engines The student will review the physics principles for momentum thrust and pressure thrust. The basic components of aero engines will be explored and the student will demonstrate an understanding of how thrust is produced, the advantages of the turbine engine, the concept of specific fuel consumption how the exhaust nozzle affects pressure thrust. Reciprocating, turboprop, and turbofan engine performance and operational characteristics will be covered.

3 Airframe Systems The student will be able to describe the basic operating principles of hydraulic systems and subsystems, electrical systems, fuel systems, landing gear and the basic airframe structure. Details of system components will be presented as well as consideration of subsystem and component failure effects.

2 Aircraft Performance The student will develop a fundamental understanding of the application of aerodynamic theory and principles to aircraft performance. This will include climbing and descending flight, fundamentals for calculating range and endurance, maneuvering flight and multi-engine aircraft operations. Application of the flight handbook charts and graphs pertinent to aircraft performance. The student will demonstrate the ability to make computations necessary to prepare for flying the 13

aircraft within its flight envelope. The student will be able to understand performance curves.

3 Aerodynamics, Stability, and Flight Controls Introductory course into transonic flight, supersonic flight and associated flight controls systems. Special emphasis will be placed on transonic flight and its effect upon aircraft design. The student will be able to explain the formation of shock waves, types of shock waves and the lift and drag problems associated with transonic flight. The student will demonstrate knowledge of stability axes and moments about these axes. The student will learn the basics of multi-engine center of gravity calculations and flight limitations based upon weight, density, configuration and airspeeds. Flight control design including fly by wire will be presented.

2 Cockpit Resource Management and Human Factors This course is designed to give the student an overview of human factors and the necessity for good man-machine interface and design. The student will gain an understanding for the application of the environmental factors, human factors, and organizational factors to the development of good cockpit communication and coordination. CRM techniques will be practiced by the crews in flight training.

2 Aviation Law The student will learn the basis for aviation regulation and what he/her needs to be concerned about in the commercial aviation industry. In addition, a brief history of aviation legislation will be introduced. The emphasis of the course is to teach the student how airlines operate and the interface among pilot groups, management, and labor union, which the professional pilot will encounter.

3 Aviation Meteorology Includes the following theoretical concepts: hydrostatic instability, baroclinic instability, thermal wind, and kinematic fields. These will be integrated into real-time weather analysis of synoptic patterns involving mid-latitude cyclones, advection, frontal systems, and jet streams. Practical application will be achieved through presentation of current and historical weather data emphasizing common hazards to aviation such as thunderstorms, strong winds, fog, icing, and turbulence. An introduction to weather forecasting concepts will be presented.

3 Avionics and Flight Management Systems This course will be designed around specific avionics and FMS systems that are installed in current aircraft. The student will learn how the cockpit displays work, the interface between the instruments and the aircraft systems, as well as procedures for using the modern electronic display and autopilot system. This course teaches the theory and principles governing flight with autopilot and flight management systems. Students will apply theory and principles by demonstrating good decisions and thought processes in autopilot and FMS simulators.

3 International and Over Water Procedures This course will study FAR Part 121 domestic and flag regulations and evaluate their impact on long range domestic and international flights. The student will be able to use ICAO, JAA, and FAA operational requirements 14

and typical air carrier Ops SPECS to plan domestic and transoceanic flight. CBT simulation programs may be used as necessary to demonstrate actual flight scenarios. High-altitude airspace, navigation, and approach procedure chart interpretation will be examined in detail. Students will study and use the concepts of MNPS and RVSM airspace, dispatch procedures, ETOPS, ETP, driftdown, track messages, LRN accuracy checks, Oceanic Air Traffic Control clearances, international METARs and TAFs, and emergencies and contingencies while on oceanic tracks.

3 Airline Operations A study of the scope and function of a major air carrier's organizational structure and the specific relationships of the operations department with those of marketing, maintenance, and safety are discussed. A study of corporate issues including the industry in general, market structure, certification, FAR Part 121 regulations, economic issues, mergers, corporate culture, and international topics will be included. From an operational perspective, topics include flight operations employment policies, domiciles, operating specifications, types of services provided, training, and passenger considerations.

1 Career Planning and Preparation A course in which students will discuss and develop short-term and long-term job and career goals, conduct career research using various university and industry resources, prepare a personal job search portfolio, prepare resumes and letters of application, and gain insights and proficiency in interviewing skills so they are better prepared to enter the job market upon graduation. Students will participate in simulated interview scenarios, will be expected to correspond with at least one company, and will be involved in the evaluation of letters, resumes, and interviews.

3 Industry Internship Designed to combine classroom theory with practical application through job-related experiences. Students are actively employed in aviation business, industry, government, and a variety of organizations and agencies with a work focus which related to their academic training and career objectives. 15

**APPENDIX A3: Draft Cost Structure: Professional Airplane Pilot- BS (UHH)
2014/2015 Tuition**

- In-State \$3,324 per term for 8 terms = \$26,592 Total
- Out-of-State \$9,324 per term for 8 terms = \$74,592 Total

Flight Lab Fees

- \$143,800 Total for all courses (Using a Technologically Advanced Aircraft -TAA)
- \$94,200 Total for all courses (using a traditional primary trainer)

Certificates Earned:

Private Pilot
Instrument Rating
Commercial Pilot Single-Engine
Commercial Pilot Multi-Engine
Flight Instructor
Flight Instructor – Instrument

Total Degree Cost (Tuition & Flight Fees)

In-State Tuition

- \$170,392 in a TAA (\$42,598 per year)
- \$120,792 in a traditional primary trainer (\$30,198 per year)

Out-of-State Tuition

- \$218,392 in a TAA (\$54,598 per year)
- \$168,792 in a traditional primary trainer (\$42,198 per year)

APPENDIX A4: International Aviation Training Center at Hilo International Airport