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PROPOSAL FOR NEW ACADEMIC PROGRAM
FIRE SCIENCE PROGRAM
Associate in Science and Certificate of Achievement

Background:

Hawai`i Community College (HawCC) will offer a Fire Science Program with a Certificate of Achievement (C.A.), and an Associate in Science (A.S.) Degree.

Honolulu Community College (HCC) currently has the only Fire Science Program offering a Certificate of Achievement (C.A.), and an Associate in Applied Science (A.A.S.) Degree in the State. Residents of the Island of Hawai`i wishing to pursue a career in fire science often cannot attend college on Oahu for various reasons, such as the travel to and the general cost of living on Oahu, family commitments, etc.

The federal, state, and local fire agencies of the Big Island have organized into the Big Island Wildfire Coordinating Group (BIWCG). Members include: the National Park Service, U.S. Fish and Wildlife Service, U.S. Army, Division of Forestry and Wildlife, Hawai`i County Civil Defense, and Hawai`i Fire Department. All are supportive of having a Hawai`i Community College Fire Science Program. Their commitment to this program is described later in this proposal.

Justification:

- Once established, HawCC plans to pursue an articulation agreement with Colorado State University allowing students with an A.S. Degree to seek a Bachelor of Science Degree in Fire Science thru distance learning. All fire management positions for any federal agency now require a B.S. degree.
- General Education requirements and specific courses offered at HCC are different than at HawCC.
- Working closely with the Fire Chief of Hawai`i Fire Department the program can be customized to meet the needs of the department, and the people of the Big Island.
- The needs and mission of the City & County of Honolulu Fire Department, and the Hawai`i Fire Department are different. The Big Island is mostly rural with the urban population growing, which is increasing the wildland/urban interface hazards.
- Due to an increase of alien fire promoting grasses the natural fire regime on the Big Island is changing with an increase in fire size and fire intensity.
- The Hawai`i Fire Department has numerous volunteer fire departments whereas the City & County of Honolulu Fire Department does not.

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- One of the Hawai`i Fire Department's missions is providing Emergency Medical Services (EMS) to the residents of the Big Island, and Oahu contracts this service out.

1. What are the Objectives of the Program?

The Fire Science Program is a four-semester program which prepares individuals for entry employment in the Fire Service field as well as meeting the needs of the in-service professionals. Emphasis is placed on four basic areas of fire safety: Structural Fire, Wildland Fire Control, Emergency Medical Services, and Management and Administration. Students completing the program may earn a Certificate of Achievement (33 credits), or an Associate in Science Degree (61 credits). The Program will provide a wide range of Fire Science courses to include: Wildland Fire, Structural Fire, Hazardous Materials, Crash and Rescue, and Incident Management System.

Upon completion of this program the student will demonstrate knowledge and skills required to respond appropriately to fire and emergency situations at the private, city, state, or federal level with emphasis in one or more of the following areas:

- Wildland Fire Fighting
- Structural Fire Suppression
- Hazardous Materials Handling
- Prevention and Investigation
- Incident Command System

2. Are the Program Objectives Appropriate functions of the College and University?

A Fire Science Program would meet Hawai`i Community College's imperatives of providing workforce development and community development by providing graduates with the training to seek employment opportunities in the fire service. Fire service jobs are in high demand, provide high wages, and require highly skilled personnel.

Local employers such as the Hawai`i Fire Department, the National Park Service, State Department of Transportation Airports Division, State Department of Land and Natural Resources Division of Forestry and Wildlife, U.S. Fish and Wildlife Service, U.S. Army all agree that a Hawai`i Community College based program would provide a large pool of potential employees.

By providing classes towards a C.A., or A.S. degree in Fire Science at Hawai`i Community College, the Hawai`i Fire Department would be able to recognize and acknowledge the degree for entry level positions, career advancements and promotion within the department.

Presently, candidates vying for an entry level fire fighter recruit position are not recognized or credited by the Fire Department for having a fire science degree based on lack of availability to the general and local population. Historically, approximately 5-10 applicants annually have various degrees. Once a Fire Science

A.S. program is established , recruitment credit for a degree in Fire Science will be developed and implemented by the Department.

Although few employees currently possess a Fire Science degree due to a lack of an available and accessible program, individuals who have already obtained an educational degree have demonstrated that their educational and physical capabilities allow them to qualify for higher ranking positions. As an example, during a recent promotional process for Fire Equipment Operator, only one candidate possessed an A.S. Degree in Fire Science and he attained the maximum obtainable points for the Education and Experience component of the selection process which assisted in the overall assessment score and subsequent promotion. It would be desirable to be able to require a Fire Science Degree as a minimum qualification for specific ranked positions; however, until the program is made available and accessible to the employees, it would be exclusionary to have such requirements.

Currently the County of Hawai`i Fire Department maintains the employment of over 330 uniformed fire fighters/emergency medical services providers as well as a cadre of over 325 volunteer fire fighters. Given the current economic trends and the construction boom, the service demands and resource inventory needs will increase. Concurrently, the restructuring and reorganization of the department necessary to meet these challenges will result in an increase in recruitment and career advancement opportunities.

The County of Hawai`i Fire Department is currently challenged with filling 346 vacant positions and 107 new positions for existing Fire Stations. These numbers would increase with the development of new fire stations. Over the past two years, Hawai`i County has trained 160 new fire fighter recruits.

In the Hawai`i Fire Department Annual Report 2001-2002, the Hawai`i Fire Department takes great pride in being the only Fire Department in the State to incorporate the Emergency Medical Services Program into its primary mission profile. Having personnel dual-trained and capable of providing a variety of specialized functions makes for operational flexibility and efficiency and has manifested in a direct impact on victim survivability as well as promoting a more consistent and efficient transition of victim care. The Hawai`i Fire department's newest firefighters were the first recruits to undergo basic emergency medical technician training and receive EMT-B certification. Effective training is the key to providing quality service and to better serve the public.

The Hawai`i Fire Department Volunteer Division represents another unique concept implemented to support the delivery of critical emergency services. The delivery of fire protection and other essential services to the island's many remote and isolated "pocket" communities would be a financial and logistical impossibility without the support of an active volunteer fire fighter program. Presently, the Hawai`i County Fire Department's Volunteer program consists of 23 Volunteer Companies and over 300 Volunteer Fire Fighters.

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The Fire Science program will afford opportunities for members of the volunteer fire departments to upgrade their skills by attending individual fire courses.

The County of Hawai`i is home to Pohakuloa Training Area (PTA), the largest DOD installation in the State of Hawai`i, and the Keaukaha Military Reservation with 509 acres. It is also home to four National Park Services sites and four airports.

County of Hawai`i National Parks Services

Pu'ukohola Heiau National Historic Site	85.30 acres
Pu`uhonua o Honaunau National Historical Park	182 acres
Kaloko-Honokohau National Historic Park	1160 acres
Hawai`i Volcanoes National Park	333,000 acres

County of Hawai`i Airports

Hilo International Airport	1,391 acres
Kona International Airport at Keahole	3,450 acres
Upolu Airport	> 20 acres
Waimea-Kohala Airport	90 acres

The following agencies are responsible for fire incidents on the Island of Hawai`i:

- o Hawai`i County Fire Department
- o State of Hawai`i Division of Forestry and Wildlife
- o National Park Service
- o U.S. Fish and Wildlife Service
- o U.S. Army
- o Hawai`i County Civil Defense

All are members of the Big Island Wildfire Coordinating Group (BIWCG).

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3. How is the Program Organized to meet its Objectives?

The following curriculum was developed to meet the requirements of the Community College:

<u>First Semester (Fall):</u>	<u>CA</u>	<u>AS</u>
Fire 101 Essentials of Fire Suppression	3	3
Fire 151 Introduction to Wildland Fire Control	3	3
Fire 156 Incident Command System	3	3
English 100 Expository Writing		3
Math 100 Survey of Mathematics or higher, or Philosophy 110 Introduction to Logic		<u>3</u>
		15 credits
 <u>Second Semester (Spring):</u>		
Fire 153 Advanced Wildland Fire Control	3	3
Fire 157 Intermediate Wildland Fire Behavior	3	3
Chem. 100/L Chemistry for Non-Science Majors		4
ICS 101 Digital Tools for the Information Age		<u>4</u>
		14 credits
 <u>Student Temporary Employment Program (Optional)</u>		No Credit
 <u>Third Semester (Fall):</u>		
Fire 107 Fire Fighting Tactics and Strategies	3	3
Fire 154 Wildland/Urban Interface Operations	3	3
Fire 202 Fire Hydraulics	3	3
Botany 130/L Plants in Hawaiian Env. (<i>Natural Science</i>)		4
Public Speaking (<i>SpCo 251 Humanities</i>)		<u>3</u>
		16 credits
 <u>Fourth Semester (Spring):</u>		
Elective (<i>Social Science 100 level or higher</i>)		3
Fire 207 Hazardous Materials Operations	3	3
Fire 208 Aircraft Rescue Fire Fighting	3	3
Fire 210 Fire Administration	<u>3</u>	3
Phys. 100 Concepts of Physics		<u>3</u>
		15 credits
	Total: 33 credits	60 credits
 Fire 193 Cooperative Education (<i>Optional Elective</i>)		
		3
 Total Credits: Certificate of Achievement - 33 credits (fire) Associate in Science - 60+ credits (33 fire and 27 Gen. Ed.)		

Curriculum Overview: The Hawai`i C.C. Fire Science curriculum has been customized to meet the needs of the Big Island fire service agencies. The program will provide students with the training required to perform as a structural and a wildland firefighter. The fire science program also covers a variety of disciplines that will provide students with the tools necessary for success in the fire service such as: an understanding of the science of fire behavior, the effects wildland fire has on various ecosystems both on the mainland and in Hawai`i, public speaking, writing, math, computer skills and fire administration.

Once established, we plan to eventually expand the curriculum to provide classes in the Emergency Medical Services (EMS) area. A First Responder course would require approx. 40 hrs. of training. An EMT-Basic in accordance with Department of Transportation guidelines would require 160 hrs. of training. Neither of these courses is offered regularly on the Big Island. However, numerous agencies would benefit from these programs such as NPS Rangers, Hawai`i County Police, ocean safety personnel, private contractors, etc. It is intended the EMS training will enhance students' knowledge and job performance. Although a certificate program is not envisioned at this time, the required training hours in accord with DOT guidelines would be sufficient to support a Certificate of Completion in the future.

Student Temporary Employment Program (STEP): The STEP program is sponsored by the United States Forest Service, and provides employment opportunity for seasonal work as a wildland firefighter on the mainland. Under this program students must be enrolled in a fire science program with 6 semester credits or more for both the spring and fall semester, and they must have a 2.0 GPA or higher. The USFS pays the student's airfare from Hawai`i to the mainland and return. Students are assigned to a wildland engine on the Fremont National Forest in Oregon, and have the opportunity to make money and gain valuable wildland fire suppression experience. There is no credit given for this program, and it is optional. Two Hawai`i Community College students have been hired under the Student Temporary Employment Program (STEP) for the summer of 2008.

Program Elective: Students enrolled in the AS degree program will be offered the opportunity to work with the Hawaii Fire Department on a supervised practicum. This will be an optional elective FIRE 193 Cooperative Education which will be an additional three credits resulting in a total of 63 credits for the A.S. degree.

Program Learning Outcomes:

Upon successful completion of the fire science program, students will be able to:

1. Meet the minimum training requirements of the National Fire Protection Association's (NFPA) Standard 1001, *Standard for Fire Fighter Professional Qualifications* (Fire Fighter I).
2. Perform as a fully qualified wildland firefighter in accordance with National Wildfire Coordinating Group PMS 310-1 standards.

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3. Utilize the Incident Command System to manage a wide variety of planned and un-planned incidents.
4. Utilize modern fire service strategies, tactics, and management for both structural and wildland fire incidents.
5. Identify hazardous materials, hazardous properties, and successful emergency scene operations.
6. Use the principles of supervision and management for leadership and administration in the fire service.
7. Apply the theoretical principles of the chemistry of fire, and hydraulics to solve water supply problems.

Program Development:

It is also envisioned that thru collaboration with Honolulu Community College's Fire Science Program students can mutually benefit from the complementary curricular emphases of the two programs. For instance HonCC places more emphasis upon structural fire fighting and the HawCC program will place more emphasis upon wildland and wildland/urban interface firefighting.

Hawai'i County Fire Department has received \$300,000.00 for the purchase and installation of video conferencing equipment. This system will be on-line by February, 2009. HawCC will partner with Hawai'i Fire Department to establish classrooms in the various fire stations located throughout the Island of Hawai'i. These classrooms will initially be established in Kona and Waimea and allow students from the west side of the island to attend fire science courses through video conferencing.

Requirements:

Entering Requirements: Application and admission information may be obtained from the Admissions and Registration (A&R) Office, Manono Campus, Bldg. 378, or the University of Hawai'i Center at West Hawai'i, Student Services (WHSS) Office in Kealahou. Forms may also be downloaded from www.hawaii.edu/admissions.

Required Levels for Entry into the Fire Science Program: The Fire Science Program is open to any high school graduate or person 18 years of age or older who can benefit from the instruction offered. The majority of fire courses have prerequisites.

Graduation Requirements: A Certificate of Achievement will require completion of all Fire courses (33 credits) with a 2.0 GPA or Higher. An Associate in Science degree will be awarded with completion of the two-year program (61 credits) with an overall GPA of 2.0 or Higher (students must earn a "C" grade or Higher for all FIRE courses).

Admissions Policies: Admission policies are the same as those for the UHCC system. All students who meet the necessary Math and English entry requirements will be able to enter program courses. Students who have special needs will be accommodated to the extent practicable.

Advising and Counseling: Hawai`i Community College has an academic advising and counseling program and its Student Orientation, Advising and Registration (SOAR) sessions advise students wishing to enter the Fire Science program.

4. Who will Enroll in the Program?

Special Target Groups: The Fire Science Program is targeted for the following groups:

- High school graduates and non-traditional students who wish to seek employment opportunities with the Hawai`i Fire Department, and other agencies that employ fire fighters.
- Employees of the Hawai`i Fire Department who want to enhance their opportunities for advancement within the department.
- Members of the various volunteer fire departments (with over 300 volunteers island-wide) may want to take selective fire courses to upgrade their skills and knowledge.
- Personnel who are interested in taking selective fire courses for their own benefit Example: Fire 151 course qualifies individuals to fight wildland fires for federal agencies and be picked up as emergency firefighters; personnel in the emergency response area may want to take Fire 156 Incident Command System which is required by federal law for all federal, state and local agencies receiving federal aid, etc.

Number of Majors Expected for the First Five Years: It is expected that up to 25 students per year will be able to enter the program, based on the resources available and projected employment demand. The total expected for the first five years is 85 majors.

Expected Service to Non-majors: Several of the courses that are part of the Fire Science curriculum will be open to non-majors depending on the number of students in the program.

Evidence of Student Interest: With the support and cooperation of the Honolulu Community College Fire Science Program, fire science courses were conducted on the HawCC Manono Campus in Hilo, starting with the spring 2005 semester and ending with the spring 2007 semester. The funding and tuition were paid for from a Rural Development Grant.

- Number of students who have already benefited from the limited fire science courses.
 - Fire 151 - 75 students, HCFD (Hawai`i County Fire Department Employees)
 - Fire 152 - 52 students, HCFD

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- Fire 151 - 20 students, civilians
 - Fire 151 - 11 students, Emergency Response Academy
 - Fire 154 – 20 students, civilians & HCFD
 - Fire 156 – 31 students, civilians & HCFD
 - Fire 157 – 13 students, civilians & HCFD
- Total of 222 students attended.

Hawai`i Community College began offering credited courses with students paying full tuition for the:

Fall, 2007 semester.

- Fire 151 – 23 students
- Fire 156 – 14 students

Spring, 2008 semester.

- Fire 154 – 12 students
- Fire 157 – 12 students

These numbers are without the benefit of a fully established program.

5. What Resources are Required for Program Implementation and First Five-Year Cycle of Operation?

Personnel:

A tenure leading position (1.0 FTE Faculty) and 0.2 Lecturer will be requested as part of the next biennium budget request for the college. Currently, a full time temporary position (0.4 Lecturer) is instructing courses.

YEAR	FY 09	FY 10	FY 11	FY 12	FY 13
PROGRAM COSTS					
Faculty/Lecturers w/o fringe	58,986	58,986	66,564	74,142	81,720
Library	3,000	1,000	1,000	1,000	1,000
Equipment/Supplies	3,000	3,240	3,360	3,495	3,635
Other					
TOTAL Expenses	64,986	63,226	70,924	78,637	86,355

Library Requirements:

Currently, the library on the UH-Hilo campus is shared with Hawai`i Community College, and will need an initial purchase (\$3,000) of publications (National Fire Codes, etc.), but only minimal spending to keep current with fire science developments (\$1,000 per year).

Supplies and Equipment:

Office and storage space for administering the Fire Science program will be needed. There will be an initial expenditure of \$3,000, with expenditures increasing 8%

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annually to provide logistical support for the fire program. Additional equipment necessary for instruction will be provided by the Hawai`i Fire Department and the National Park Service.

Source of Funds:

HawCC has included funding for this program in its 2009-11 Biennium Budget proposal as part of its *Workforce Development* Program Change Request. If this funding fails to be supported, the college will support the program with tuition and fees money to support a temporary faculty position and any needed lecturer funds. The college will re-examine supplies and library needs to cut costs to the minimum in these areas. The college is fortunate to enjoy a very supportive relationship with the Hawai`i Fire Department and the National Park Service in terms of access to training equipment that might otherwise be prohibitively expensive

How Efficient will the program be?

Although Honolulu Community College has a similar program, our projected enrollments are based on past student interest and personnel costs.

REVENUES	FY 09	FY 10	FY 11	FY 12	FY13
Projected Enrollment (# Majors)	25	37	49	61	73
No. of Courses	11	12	12	13	13
No. of Credits	12	12	12	12	12
SSH	300	444	588	732	876
Tuition Rate/Credit	71	79	88	97	97
Total Revenue from Tuition	21,300	35,076	51,744	71,004	84,972
Other Sources of Income					
TOTAL Revenues	21,300	35,076	51,744	71,004	84,972

Academic Cost and Revenue Template – New Program (see attached)

6. How will Effectiveness of the Program be Demonstrated?

Projected Number of Graduates Yearly:

The first class will graduate in May 2010 with perhaps 5-10 graduates. Eventually, it is projected that the program will graduate 25 students annually. Recruitment is being carried out through school visits on Hawai`i Island, and through mailings to other island schools. Additional recruitment is taking place through mailings to all career related programs in the State and to Federal and State agencies. A Fire Science brochure has been developed and is currently being distributed at various functions such as “Building Better Bridges”, “2008 Opportunities Expo”, etc. which promote the fire program.

Placement of Graduates:

Program faculty is working closely with the Hawai`i Fire Department which is expected to hire the majority of graduates. Faculty is also working closely with potential employers with State and Federal agencies.

A Fire Science Advisory Board has been established to support the program:

- Mr. Darryl Oliveira, Fire Chief, Hawai`i Fire Department.
- Mr. Joe Molhoek, Pacific Island Fire Management Officer, National Park Service.
- Mr. Wayne Ching, State Forestry.
- Mr. Eric Moller, Fire Chief, U.S. Army.
- Mr. Andy Kikuta, U.S. Fish and Wildlife Service.
- Mr. Quince Mento, Hawai`i County Civil Defense
- Ms. Denise Laitinen, Firewise Community Coordinator
- Mr. Miles Nakahara, Hawai`i Wildfire Management Organization

Student Satisfaction:

Evaluation will be completed during each course and after the students begin their employment to determine whether the program is satisfactorily meeting its goals. The program will be modified to meet student needs during each year of the program.

Career and Employer Satisfaction:

Employer evaluations, as well as direct contact will give feed-back on how well the students are meeting their expectations, how the program can be changed and improved. The Fire Science Advisory Board will meet at least twice a year, and the program will be changed and adjusted to meet the requirements of the employment agencies.

Fire Science Program Proposal

Initiated By: _____ **Date:** _____
Jack M. Minassian

Requested By: _____ **Date:** _____
Division/Department Chairperson

Recommended By: _____ **Date:** _____
Curriculum Committee Chairperson

Approved By: _____ **Date:** _____
Academic Senate Chairperson

Approved By: _____ **Date:** _____
Vice Chancellor of Academic Affairs

Approved By: _____ **Date:** _____
Chancellor