Substantive Change Proposal
Fire Science Program

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October 1, 2010
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Substantive Change Proposal Fire Science Program

A. A concise description of the proposed change and the reasons for it

Brief Description

Hawai‘i Community College proposes to add to its curriculum a Fire Science Program that prepares individuals with the academic knowledge and skills needed for entry-level employment in the Fire Service field, as well as meets the needs of in-service professionals.

Upon successful completion of this program, students will have the ability to enter a career with federal, state, and local fire and emergency service agencies. The program will offer courses in structural fire fighting, wild land fire suppression, hazardous materials management, fire prevention and investigation, crash and rescue, fire management and administration and the incident command system. Students completing the four-semester program will earn a Certificate of Achievement (C.A.) after 30 credits, and/or an Associate in Science Degree (A.S.) after completing a minimum of 60 credits [Course Listing].

After earning the Associate in Science (A.S.) Degree, students have the opportunity to pursue a Bachelor’s Degree in Fire Administration from Colorado State University through distance learning.

Relationship to the institution’s stated mission

The Hawai‘i Community College’s Mission is the following:

Hawai‘i Community College promotes student learning by embracing our unique Hawai‘i Island culture and inspiring growth in the spirit of “E Imi Pono” (excellence). The purpose of Hawai‘i Community College is to offer programs, courses, and activities to fulfill the diverse educational, training, and community needs of the residents of the island as well as the State of Hawai‘i. [Hawai‘i Community College Mission]

The Fire Science Program will help Hawai‘i Community College to honor its mission by offering a certificate and degree program in an area of need in the community. Several factors have increased the necessity for a larger, better trained cadre of firefighters. First, with the development of Hawai‘i’s rural communities, more professional and volunteer firefighters are needed to staff new fire stations, replace retiring firefighters, and respond to an increasing number of emergencies. Furthermore, this program would offer valuable in-service training to employed firefighters, as the field of fire fighting has changed significantly, requiring that firefighters have a higher degree of education (including, for example, a deeper understanding of science, knowledge of hazardous materials and emergency management procedures). Finally, environmental changes in the islands (drought and the proliferation of invasive highly flammable...
alien grasses) have necessitated training for high fire intensity conditions. Fire service jobs are in high demand, provide high wages and require highly skilled personnel.

The request for a Hawai‘i Community College Fire Science Program initially came from the Hawai‘i County Fire Department Chief and has been confirmed by the employment and training demands of our local National Parks 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.

Discussion of the rationale for the change

The Fire Science Program has grown out of a clear and immediate need for well-trained firefighters for the Big Island, as well as other rural islands where no training was available. According to the County of Hawai‘i Annual Report 2008 – 2009, “The Fire Department operates with 350 career or paid fire fighters, 225 volunteer members, as well as 46 employees who serve within six support divisions” [Hawai‘i County Annual Report]. Many positions remain unfilled. In addition, trained firefighters are needed in our local National Parks Service; the four National Parks or Historical Sites on the Big Island (including the large Hawai‘i Volcanoes National Park) employ dozens of firefighters or rangers who must be knowledgeable about fire risk and protection [National Park Service].

Firefighters are also employed by the State Department of Transportation Airports Division, State Department of Land and Natural Resources Division of Forestry and Wildlife, U.S. Fish and Wildlife Service, as well as the U.S. Army.

Until 2005, the only other University of Hawai‘i institution offering fire science education and training was Honolulu Community College, but for numerous reasons, this program did not meet the needs of the Big Island community. Honolulu CC’s program addresses the specific fire safety needs of a largely urban population, whereas Hawai‘i CC’s program equips graduates for the special requirements of the rural islands of the state. Additionally, Hawai‘i CC’s Fire Science program offers a local, affordable option for Big Island students to advance their status for entry and promotion in the field. Finally, this program provides desired training for the increasing numbers of volunteer fire fighters, who are particularly unlikely to travel to another island for their education.

The Fire Science Program began its development in 2005 with courses taught by a local lecturer and supported by a grant from the federally funded Rural Development Program. In 2007, Perkins funding provided for some of the basic material needs of a nascent program on Hawai‘i CC’s campus. In March 2009, Fire Science faculty obtained approval from the University of Hawai‘i Board of Regents to run a provisional program at Hawai‘i Community College. Since that time, enrollment has doubled in size, and, given student interest, could double again. (Limits on enrollment at this time reflect difficulty in finding qualified instructors to teach additional sections of the first year courses.)

The Hawai‘i County Fire Department, which currently has a 20 percent vacancy rate due to retirements, anticipates hiring 20 – 30 recruits from this program annually. Already, students
have participated in temporary internships with the U.S. Forest Service, the Fish and Wildlife Service, and the U.S. Army.

B. If the substantive change involves a new educational program, a description, including evidence that:

Educational purposes of the change are clear and appropriate

The purpose of the Fire Science Program is to provide the knowledge and skills needed for students to prepare for a career with federal, state and local fire and emergency service agencies, or to meet the in-service training needs of professionals in this field [Program Description].

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

- Wild-land Fire Fighting
- Hazard Materials Handling
- Structural Fire Suppression
- Natural Disaster Response
- Prevention and Investigation
- Incident Command System

The curriculum has been developed by highly experienced industry leaders, and classes are taught by seasoned firefighters, including the present Chief of the Hawai`i County Fire Department. There is a large Fire Science Advisory Board that has guided the development of appropriate program goals and has met with faculty to review Program Learning Outcomes, assessment artifacts and curriculum. Advisory Board members include:

- Fire Chief, Hawai`i Fire Department
- Pacific Island Fire Management Officer, National Park Service
- Fire Management Officer, State Division of Forestry & Wildlife
- Fire Chief, U.S. Army
- Maintenance Supervisor, U.S. Fish and Wildlife Service
- Director, Hawai`i County Civil Defense
- Firewise Community Coordinator
- President, Hawai`i Wildfire Management Organization

In accordance with Commission Standards, the Fire Science Program has clearly defined student learning outcomes [Program Description] and assessment plans. Assessment efforts focus on assuring faculty that learning relates to the needs of the industry.
Furthermore, the Fire Science Program is designed to meet the standards of the National Fire Protection Association (NFPA), and the National Wildfire Coordinating Group (NWCG), the preeminent fire training and standards organizations in the United States.

All relevant Commission policies are addressed and the proposed program meets the accreditation standards related to the Student Learning Programs and Services and Resources.

As addressed above and in Section G below, the Fire Science Program meets Commission policies and standards related to student learning programs, services and resources.

C. A description of the planning process which led to the request for the change

How the change relates to the institution’s planning process and stated mission.

In 2005, Jack Minassian, Pacific Island Fire Management Officer (Ret.), National Park Service, met at the request of Hawai‘i Community College (HawCC) administration to explore the idea of a Fire Science Program at the college. As the Fire Science Program clearly contributes to meeting both workforce needs and HawCC’s mission, the Vice Chancellor of Academic Affairs provided seed money that would enable Mr. Minassian to develop the curriculum leading to a degree in Fire Science.

The assessment of needs and resources which has taken place.

Funding for this program in the initial stage was provided by a two year Rural Development Grant, which supported the program until the Fall 2007 semester. During the planning of this program, Mr. Minassian identified the following needs for the Fire Science Program:

- One full time faculty member and .6 part time lecturer(s),
- Some (minimal) library resources,
- Office space for the Fire Science faculty and storage space for equipment necessary for the program, and
- Firefighting equipment.

All funding came initially from a grant, except for the firefighting training equipment, which was borrowed from the local fire department. (There continues to be a strong relationship between the County Fire Department and HawCC’s Fire Science Program, facilitating the ease with which equipment is available on an ongoing basis.)

As the program has continued, the faculty positions have been supported by general funds.
The anticipated effect of the proposed change on the rest of the institution.

The only anticipated change that the Fire Science Program will have on the rest of the institution is that it will attract students who are interested in Fire Science to the college, and this will impact enrollment in general education courses which students will take as a part of this program.

Furthermore, more students will graduate with degrees from HawCC in an area of need for training and employment in the Big Island community, as well as in other rural areas of the state.

A clear statement of the intended benefits that will result from the change.

Please see Section A above pertaining to the rationale for the Fire Science Program.

A description of the preparation and planning process for the change.

In 2007, Mr. Minassian completed and submitted an Authorization to Plan (ATP) that outlined the activities he proposed to undertake during the early phase of this program, including:

- Developing course curriculum and outlines;
- Recruiting lecturers for specific courses;
- Meeting with facility staff to secure classroom/office space;
- Recruiting students;
- Developing a brochure for the program;
- Consulting and articulating with fire service organizations, including Big Island Wildfire Coordination Group, California, Nevada and Hawai’i Wildfire Councils, Hawai’i Fire Chiefs Organization, West Hawai’i Wildfire Management Organization, and FIREWISE;
- Developing a Fire Science Advisory Board;
- Exploring video conferencing possibilities; and,
- Developing procurement support for instructor materials and student workbooks.

This was submitted in February 2008. Except for developing of a brochure, all of these were accomplished. (The college created a Fire Science program website instead of a brochure.) Fire Science Program’s courses proposals passed through the HawCC’s Curriculum Review Committee (passed on October 12, 2009), and through the Faculty Senate (approved on October 31st, 2009).

D. Evidence that the institution has provided adequate human, administrative, financial, and physical resources and processes:
Evidence of sufficient and qualified faculty, management, and support staffing.

Mr. Minassian, who remains the primary (and only full-time) faculty member for this program, has a B.S. from Northern Arizona University and 34 years experience in firefighting with the National Park Service. In addition, he is a Fire Training Officer for the National Park Service. He is certified nationally as an Incident Commander Type III, Prescribed Burn Boss Type II, Division/Group Supervisor, and Resource Unit Leader.

Mr. Minassian initially taught Fire Science courses for Honolulu Community College. As it became evident that the need for well trained fire fighters on Hawai‘i Island was urgent, HawCC’s Vice Chancellor for Academic Affairs hired Mr. Minassian, in 2007, to develop/create a certificate/degree Fire Science Program at HawCC.

Evidence of appropriate equipment and facilities, including adequate control over any off-campus site.

Students in Fire Science courses and labs use equipment for training that is housed at and maintained by the County Fire Department. Facilities that are used by the program belong to HawCC.

Evidence of fiscal resources including the initial and long-term amount and sources of funding for the proposed change.

See section C, above.

HawCC will use funding from tuition and fees to provide for the fiscal resources needed to support the program.

Evidence of a plan for monitoring achievement of the desired outcomes of the proposed change.

The Fire Science Program will monitor achievement of the desired outcomes in two ways:

As best as we can, we will attempt to track student success in the local firefighting agencies as well as in their articulation to further educational programs in Fire Science.

Also, faculty will document achievement by participating in program learning outcomes (PLO) assessment which monitors student learning. The first cycle of PLO assessment for the Fire Science Program will be done in the Fall 2010 and will be posted on the college website. The plan for this will soon be uploaded at the Assessment Website. (This website is under construction at this time.)
E. Evidence that the institution has received all necessary internal or external approvals

A clear statement of what faculty, administrative, governing board, or regulatory agency approvals are needed, and evidence that they have been obtained.

The program uses textbooks and follows instructor’s guides that are approved by the National Fire Protection Agency (NFPA) and the National Wildfire Coordinating Group (NWCG). Furthermore, Hawaii CC fire courses have been reviewed by Colorado State University (CSU) and through an articulation agreement, CSU will accept all HawCC’s courses as undergraduate credit towards a Bachelor of Science Degree in Fire Administration.

Fire Science courses were presented and approved through the Curriculum Review Committee and the Faculty Senate in Fall 2009.

Evidence that any legal requirements have been met.

There are no legal requirements for adding this new program to the curriculum at Hawai‘i Community College. The Board of Regents has approved of the development of this Program, and final approval will take place in 2011.

Evidence of governing board action to approve the change and any budget supporting the change.

The Board of Regents has approved of the development of this Program, and final approval will take place in 2011 [BOR Approval].

F. Evidence that each Eligibility Requirement will still be fulfilled.

Overall, the change of offering the Fire Science Program does not significantly affect Hawai‘i CC’s Eligibility Requirements, as summarized below:

1. Authority – the Fire Science Program will have no impact on the State Legislature and University of Hawai‘i Board of Regents’ role in the governance of HawCC.

2. Mission – HawCC’s mission statement will be better met by the change as the Fire Science Program provides an important and needed educational opportunity for students on the Big Island.
3. **Governing Board** – the Fire Science Program will have no impact on the role of the UH Board of Regents (BOR). The BOR has already approved of this change.

4. **Chief Executive Officer** – the position of Chancellor will not be impacted by the Fire Science Program.

5. **Administrative Capacity** – the Dean for Liberal Arts and Public Services will have oversight for the Fire Science Program, so this program will add to his/her duties, but only in a minor capacity. The addition would in no way require additional administration.

6. **Operational Status** – the Fire Science Program will not impact HawCC’s operational status except to increase enrollment (potentially about 1%).

7. **Degrees** – the Fire Science Program will lead to an increase in the number of degrees which would be awarded to students who have successfully completed the Fire Science Program.

8. **Educational Programs** – the Fire Science Program increases by one the educational programs offered by HawCC. This two year program is completely congruent with the college’s mission. It is designed to meet the standards of the National Fire Protection Association (NFPA) and the National Wildfire Coordinating Group (NWCG), the preeminent fire training and standards organizations in the United States. It is comparable or exceeds the requirements of other fire science programs in length and content. This program has articulated clear, normative student learning outcomes and is taught by highly experienced and qualified faculty. Quality and rigor of this program will be closely monitored by a large Advisory Board.

9. **Academic Credit** – the Fire Science Program will award academic credits in the conventional way. The Fire Science courses will be a semester long, with credits allotted to the same number of classroom hours and/or lab time as in all other programs of the college and at University of Hawai`i institutions.

10. **Student Learning Achievement** – information about the description, purpose and goals of the Fire Science Program have been published on the college website [Program Description]. The Fire Science Program will monitor student learning through assessment of, at a minimum, one Program Learning Outcome each year, as required by the HawCC Assessment Committee. A plan of ongoing program assessment has been devised to make sure the program meets college and national industry standards and will be published on the college website [Assessment Website]. Industry Advisory Board members will be involved in the assessment process, as well.
11. **General Education** – the Fire Science Program will not impact the College’s general education except that Fire Science students who are pursuing the AS degree will be taking General Education courses. Their enrollment will have a small impact on these courses.

12. **Academic Freedom** – the Fire Science Program will not impact the College’s policy statement on academic freedom, found in the current catalog [Hawai‘i Community College Catalog 2010-2011], nor will this program be, in any way, exempt from the academic freedom policies of the college.

13. **Faculty** – the faculty needs for the Fire Science Program will, to begin with, entail hiring one full time instructor and .6 part time lecturer(s). These additional faculty members will be hired following all University of Hawai‘i requirements and procedures. They will need to meet the minimum qualifications for the position.

14. **Student Services** – the change will impact the student support services staff, but not in a significant way. Members of the staff will be informed of the new program’s requirements so that they can extend advising services to students who are pursuing Fire Science.

15. **Admissions** – the change will not impact the College’s admissions requirements in any way.

16. **Information and Learning Resources** – the change will not impact library services that students are entitled to receive. The change will lead to a minimal increase in library resources. These materials (Fire Fighting code books, for example) have already been purchased with grant money.

17. **Financial Resources** – the Fire Science Program has incurred few costs other than faculty. Fire Science classes are held in the evenings when regular classrooms aren’t normally in use, so no additional facilities were required. Because firefighting equipment is available and maintained through the Hawai‘i County Fire Department, the college will not need to purchase it. Fire fighting code books were purchased through Perkins funding, and no additional funding is needed for this program.

18. **Financial Accountability** – the change will not impact the financial accountability of the college nor of the UH system.

19. **Institutional Planning and Evaluation** – HawCC systematically evaluates and makes public how it is accomplishing its purposes, including assessment of student learning outcomes and program review. (Program reviews and assessment plans and results are
uploaded on the college website. The Fire Science Program will be part of this, just as all the other programs of the college are.

20. **Public Information** – the college produces a thorough catalog and a website which publicize all courses, programs and pertinent student information. The change will impact the content of the annual catalog in only this way: the Fire Science Program and its requirements will be included in the next production cycle.

21. **Relations with the Accrediting Commission** – the change is being communicated to the ACCJC as part of the Substantive Change requirement. The addition of a Fire Science program creates no changes in HawCC’s relationship to the college.

**G. Evidence that each accreditation standard will still be fulfilled after the change and that all relevant Commission policies are addressed.**

**Standard I: Institutional Mission and Effectiveness**  
**Mission**

Through a college-wide effort in 2007, Hawai‘i Community College developed a new mission statement that reflect the institutional commitment to the college’s educational purposes, intended student population, and commitment to student learning. Hawai‘i Community College’s mission statement provides for an expansion of its programs to meet the needs of the community of the Big Island. As the population of the Big Island grows, further development creates the need for expanded services for human and property protection, as well as increases the number of human caused fires. Furthermore, since the 1960’s, alien fire adapted grasses have become well established on the Big Island, altering the natural fire regime from a low frequency, low intensity to a high fire frequency, high fire intensity fire regime. Periods of droughts have exposed even normally non-flammable portions of Hawai‘i to extreme fire conditions. As no program outside of one on Oahu was available for outer island students who wanted to pursue an academic education in Fire Science, the development of this program was integral to meeting our Mission.

**Institutional Effectiveness**

Before the last accreditation visit in 2006, HawCC began focusing effort and resources on variety of assessment activities. Assessment efforts are integrally connected with HawCC’s Program Review process and budget allocations. The Assessment Committee oversees activities to assure institutional effectiveness of all programs, courses, and services. As stated above, the Fire Science Program will have the same requirements for assessment and program review as all the programs in the college.
Standard II: Student Learning Programs and Services

Hawai‘i Community College is fully accredited by ACCJC and continues to comply with the requirements of accreditation in the areas of student learning outcomes assessment, program review and integrated planning. HawCC applies the same standards to the new Fire Science Program to ensure that it also meets with ACCJC standards. The Fire Science Program meets ACCJC standards for programs and services, as this program will be handled like to all other programs with regards to assessment of student learning outcomes, program review and planning.

A. Instructional Programs

All credit courses and certificate programs must be approved by the HawCC Chancellor and the University of Hawai‘i’s Board of Regents. The Vice Chancellor for Academic Affairs (VCAA) is responsible for ensuring that all credit programs and courses are consistent with the mission of the college and uphold its integrity. The faculty is responsible for maintaining program and course content and integrity and for utilizing appropriate pedagogy in course delivery.

The Fire Science Program has student learning outcomes for its program and curriculum and will participate in the assessment cycle beginning with Spring 2010. Fire Science faculty will conduct an annual Program Review in Fall 2010 and a Comprehensive Program Review on a five year schedule starting from final approval of the Board of Regents of this program into HawCC’s curriculum. The College Effectiveness Review Committee (CERC) is responsible for evaluating program/unit reviews.

B. Student Support Services

Student support services for students attending this program are available from knowledgeable and trained staff on the Hilo campus (where the classes are conducted) and via e-mail. As with all services offered to HawCC students, Fire Science students will have access to counselors and advisors to help support academic and financial challenges that the students may meet. One counselor in particular is available for prospective Fire Science students, and she is in close contact with Fire Science faculty and with the Social Science Department which administers this program.

C. Library and Learning Support Services

Library and learning support services for students in the Fire Science Program are available during the day and in the evenings, identically to all other programs in the college. The Fire Safety Codes are kept updated and available for students in the library where they have access to them during the extensive hours during the day, evenings and during the weekend.
Standard III: Resources

A. Human Resources

As in all academic programs, HawCC employs qualified faculty, staff, and administrators to meet the needs of students enrolled in the Fire Science curriculum. Quality is assured by requiring a prescribed evaluation process administered at regular intervals in order to assess personnel effectiveness and encourage improvement, and by upholding the ethical standards of all personnel. An organizational chart for Fire Science is available in Appendix 2.

B. Physical Resources

The Fire Science Program utilizes two classrooms which are already a part of the physical plant of the college.

C. Technology Resources

Students have access to computer technology in the library and other computer labs to do research, homework or to communicate with the instructor and their classmates. Since Fall 2008, Laulima, an online Sakai course instructional tool, has been implemented on all the UH campuses, and faculty in the Fire Science Program has access to Laulima to use for communicating with students, recording grades, uploading course documents or various other uses depending on the program’s needs.

D. Financial Resources

HawCC applied for and received a $5,302.50 Perkins grant for the initial stages of developing the Fire Science Program. This has paid for the equipment requirements and start up costs for this program. Faculty will continue to be hired through general budget. Financially, there are no anticipated net savings or gains. (Budget spreadsheets are available in Appendix 3.)

Standard IV: Leadership and Governance

A. Decision Making Roles and Process

Fire Science Program’s course proposals passed through the HawCC’s Curriculum Review Committee (passed on October 12, 2009), and through the Faculty Senate (approved on October 31st, 2009). The Fire Science Program faculty will work with the Social Sciences Department Chair and the Dean to schedule courses and instructors each semester and to coordinate with other departments. The Vice Chancellor for Academic Affairs approves delivery of all courses.

B. Board and Administrative Organization

The University of Hawai‘i Board of Regents (BOR) consists of twelve members who are appointed by the Governor of the State of Hawai‘i with the approval of the state legislature. The
BOR is controlled by state law as codified in the Hawai‘i Revised Statutes (HRS 304-3). The BOR appoints the President of the University and approves all executive positions.

In June 2005, the BOR approved a reorganization of community colleges including the creation of a Vice President for Community Colleges who is responsible for executive leadership, policy decision-making, resource allocation, development of appropriate support services for the seven community colleges, and called for the re-consolidation of the academic and administrative support units for the community colleges. A dual reporting relationship was created whereby the community college chancellors report to the Vice President for Community Colleges for leadership and coordination of community college matters, and concurrently report to the President for University system-wide policymaking and decisions impacting the campuses. College chancellors retained responsibility and control over campus operations, administration, and management.

The Fire Science Program received BOR approval as a provisional program on March 20th, 2009 [BOR approval]. Final approval of the Fire Science Program will be in the 2011-12 academic year.

H. Other information requested by Commission staff that is pertinent to the specific nature of the change.

If requested by ACCJC, HawCC will provide additional materials relevant to Fire Science Program’s application for substantive change.

References


National Park Service [Online] // U.S. Department of the Interior. - 2010. -
http://www.nps.gov/applications/parksearch/state.cfm?st=HI.

Program Description [Online] // Hawai'i Community College Fire Science Program. - 2010. -
http://Hawai’i.Hawai’i.edu/firescience/programdescription.htm.
Appendices

Appendix 1 – Fire Science Program Course Descriptions

Fire Science

Course Descriptions

Fire 101—Essentials of Fire Suppression (3)
PreReq: Eng 21 or placement in Eng 102, CoReq: Fire 151 and Fire 156
Provides students with a comprehensive initial introduction to suppression of structural fires. Introduces definitions, terminology, and a brief history of structural fire suppression. Provides students with a basic knowledge of fire behavior, how and what materials burn, extinguishment systems, and basic methods of suppression. This course meets the minimum academic training requirements of the National Fire Protection Association’s (NFPA) Standard 1001, Standard for Fire Fighter Professional Qualifications (Fire Fighter I). (3 lec hrs.)

Fire 151—Introduction to Wildland Fire Control (3)
PreReq: Eng 21 or placement in Eng 102, CoReq: Fire 101 and Fire 156
Introduces definitions, concepts, theories, and principles of modern wildland fire control. Provides students with an overall introduction to theory and application in basic wildland fire suppression, fire behavior, wildland fire operations, suppression methods, tools, and equipment. An emphasis on safety. Completion of this course meets current NWCG 310-1 standards for Firefighter Type 2, and the required training for issuance of a Red Card. (3 lec hrs.)

Fire 153—Advanced Wildland Firefighting (3)
PreReq: Fire 151
Designed to meet the training needs for both Advanced Firefighter/Squad Boss and Incident Commander Type 5 positions. Covers how to: properly document the appropriate information during fire suppression activities; incorporate and maintain open lines of communication with all appropriate fire suppression personnel; apply LCES (Lookouts, Communications, Escape Routes, and Safety Zones) to fire line tactics; and demonstrate the steps required to properly size up a fire situation and determine appropriate tactics. (3 lec hrs.)

Fire 156—Incident Command System (3)
PreReq: Eng 21 or placement in Eng 102, CoReq: Fire 101 and Fire 151
Course describes the Incident Command System (ICS). Collectively, these features identify the unique quality of ICS as a management system for all emergency and planned event incidents.
Principle features are: management by objectives, chain of command, transfer of command, organizational flexibility, integrated communications, common terminology, and developing an Incident Action Plan. In addition, Homeland Security Presidential Directive-5 requires all federal, state and local agencies to adopt the National Incident Management System (NIMS) which ICS is part of. (3 lec hrs.)

Fire 157—Intermediate Wildland Fire Behavior (3)

PreReq: Fire 151

Designed to instruct prospective fireline personnel in wildland fire behavior for effective and safe fire management operations. Fire behavior is not an independent phenomenon - it is the product of the environment in which the fire is burning. Certain types of fire behavior are considered unusual or unexpected only because of the failure to evaluate properly the conditions, influences, and forces that are in control. To predict fire behavior, and to control and use fire effectively and safely, one must understand and use the interactions of fire with its environment. Examines the fire environment: what it is, how it varies and why, and how fire itself alters the total picture. (3 lec hrs.)

Fire 202—Fire Hydraulics (3)

PreReq: Fire 101; and “C” or better in Math 25 or 25X or “C” or better in Math 26 or placement in Math 100

Introduces terminology, definitions, and basic and complex formulas involved in fire service hydraulics. Helps students gain an understanding of the complexities involved in modern apparatus pumping and water delivery systems. Focuses on commonly used equipment and applying simple and complex mathematical formulas (theory), plus standard rules applied in fire service to gain an overall understanding of hydraulics and hydraulics application. (3 lec hrs.)

Fire 207—Hazardous Materials Awareness and Operations (3)

PreReq: Fire 101 and Fire 156

Students are introduced to initial response for Hazardous Material Incidents. Upon completion, the student will meet the training requirements of the National Fire Protection Association (NFPA), Office of Safety and Health Administration (OSHA), and the Office of Domestic Preparedness (ODP) to perform at the Awareness and Operations level. Topics include: personal safety, regulations, toxicology, Incident Command System, decontamination, chemical resources, initial response, assessment, and strategic and tactical options for HAZMAT incidents. (3 lec hrs.)

Fire 208—Aircraft Rescue Fire Fighting (3)

PreReq: Fire 101 and Fire 156

Introduction to definitions, concepts, methods, and requirements of an airport firefighter’s duties and responsibilities. Two major areas of concentration: the Federal Aviation Regulation (FAR 139) and the National Fire Code (NFC 1003). (3 lec hrs.)
Fire 210—Fire Administration (3)

PreReq: Fire 101, Fire 151, and Fire 156

Provides the student with an overall understanding of the science, leadership, and modern management in the fire service. Topics include: developing a game plan for personal success, the principles of leadership and management, leadership ethics, managing emergency services, analytical approaches to public fire protection, and community disaster planning. (3 lec hrs.)

Fire 212—Firefighting Strategies and Tactics (3)

PreReq: Fire 101, Fire 151, and Fire 156

Introduces essential elements, definitions, and terminology involved in analyzing the nature of fire, and determining needs and requirements to extinguish fires. Students develop an understanding of complexities involved in suppressing fires. Students will learn manpower, equipment, and practices with an emphasis on pre-planning, study of conflagration problems, and fire ground organization. This is a building block for future tactics and strategy classes taught by State and Federal fire programs. (3 lec hrs.)

Fire 215—Wildland/Urban Interface Operations (3)

PreReq: Fire 151

An introduction to the strategies, tactics, techniques, tools, and safety considerations related to fire operations in the wildland/urban interface. Involves aspects of suppression and prevention. (3 lec hrs.)
## Appendix 3 – Fire Science Program Budget Projections

### Academic Cost and Revenue Template - New Program (adjust template for appropriate number of years)

<table>
<thead>
<tr>
<th>CAMPUSS/Program</th>
<th>Initial (4-yr Fire Science)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisional Years (2 yrs for Certificate, 3 yrs for Associate Degree, 4 yrs for Bachelor's Degree, 5 yrs for Masters Deg)</td>
<td></td>
</tr>
</tbody>
</table>

### ENTER ACADEMIC YEAR (i.e., 2004-05)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students &amp; SSH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( A. ) New and/or excellence (Fall)</td>
<td>25</td>
<td>37</td>
<td>49</td>
<td>61</td>
<td>73</td>
<td>85</td>
</tr>
<tr>
<td>( B. ) Annual SSH</td>
<td>300</td>
<td>444</td>
<td>588</td>
<td>732</td>
<td>876</td>
<td>1020</td>
</tr>
</tbody>
</table>

### Direct and Incremental Program Costs Without Fringe

<table>
<thead>
<tr>
<th>Item</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Tuition</strong></td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
</tr>
<tr>
<td><strong>Tuition rate per credit</strong></td>
<td>$225</td>
<td>$225</td>
<td>$225</td>
<td>$225</td>
<td>$225</td>
<td>$225</td>
</tr>
<tr>
<td>( )</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>( )</td>
<td>57</td>
<td>57</td>
<td>57</td>
<td>57</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td><strong>I. Total Revenue</strong></td>
<td>$40,100</td>
<td>$40,100</td>
<td>$40,100</td>
<td>$40,100</td>
<td>$40,100</td>
<td>$40,100</td>
</tr>
</tbody>
</table>

### Program Costs per SSH With Fringe

<table>
<thead>
<tr>
<th>Item</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>K. Instructional Cost with Fringe</strong></td>
<td>$25</td>
<td>$25</td>
<td>$25</td>
<td>$25</td>
<td>$25</td>
<td>$25</td>
</tr>
<tr>
<td><strong>K1. Total Classrooms, Faculty &amp; Admin</strong></td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
</tr>
<tr>
<td><strong>K2. Cost Including Fringe of K1</strong></td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
<td>$5,527</td>
</tr>
<tr>
<td><strong>K3. Total Salary/Fringe of K1</strong></td>
<td>$2,527</td>
<td>$2,527</td>
<td>$2,527</td>
<td>$2,527</td>
<td>$2,527</td>
<td>$2,527</td>
</tr>
<tr>
<td><strong>K. Contribution of Fringe</strong></td>
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<td>$2,207</td>
<td>$2,207</td>
<td>$2,207</td>
<td>$2,207</td>
<td>$2,207</td>
</tr>
<tr>
<td><strong>L. Support Cost</strong></td>
<td>$194</td>
<td>$194</td>
<td>$194</td>
<td>$194</td>
<td>$194</td>
<td>$194</td>
</tr>
<tr>
<td><strong>M. Total Program Cost</strong></td>
<td>$339</td>
<td>$339</td>
<td>$339</td>
<td>$339</td>
<td>$339</td>
<td>$339</td>
</tr>
<tr>
<td><strong>N. Total Campus Expenditure</strong></td>
<td>$353</td>
<td>$353</td>
<td>$353</td>
<td>$353</td>
<td>$353</td>
<td>$353</td>
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