CAPE COD COMMUNITY COLLEGE
FIRE SCIENCE ASSOCIATE DEGREE PROGRAM

Program Review Report

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Overview of Site Visit

On November 28, 2005, at 1415 hours, I visited Cape Cod Community College for the purpose of reviewing the Fire Science program. Upon my arrival, Captain Robert Tucker, Fire Science Coordinator/Instructor, greeted me.

An introductory meeting was held in the office of Dr. Robert Ross, Vice President of Academic and Student Affairs. Attending were Dr. Ross, Susan Miller, Fire Science Program Administrator and Associate Dean of Business, Health, Human and Social Services, David Ziemba, Associate Dean of Academic Research, Deputy Chief Dean Melanson, Hyannis Fire Department/Fire Science Instructor, and Captain Robert Tucker, Dennis Fire Department/Fire Science Coordinator/Instructor.

After the introductory meeting, Dean Melanson, Robert Tucker and I went to the Human Resources Department where I spent time reviewing the resumes of Fire Science instructors Dean Melanson, George Russell, Robert Tucker, and Michael Young.

I then met with Dean Melanson, and Robert Tucker in the Library conference room to discuss what they felt were the pros and cons of Cape Cod's Fire Science program. We followed up with a tour of the campus, observing classrooms and equipment storage areas. During the tour, I met Dr. Rolfe Scofield, Chemistry and Hazardous Materials instructor for Fire Science.

At 1600 hours we met back in the Library conference room with the Program Review Team: Susan Miller, David Ziemba, Dennis Newman, Leonard Nelson, Dean Melanson, Robert Tucker, and Glenn Coffin, Director of Cape Cod and Islands Emergency Medical Services System, Inc. Discussion centered on ways to increase student enrollment and provide a hands-on segment to the program.

At 1700 hours we met for dinner and discussion with Dr. Ross, Debra Murphy, members of the Fire Science Advisory Committee: Anthony Caputo, Chief Steven Edwards, Chief Dennis Newman (Ret.), Lt. Ralph Reis (Ret.) Captain Michael Young; Program Review Committee and one student, Vi Fellman, Paramedic Firefighter, of Chatham Fire Department.

Vi Fellman made one statement that should be noted. "I want to be the best at what I am, a Paramedic/Firefighter". I ask you, does this student need to take the Fire Department Management and Planning course or the Fire Company Management class at this time? An alternative Fire Science course might better suit her needs. If Cape Cod Community College is similar to most Massachusetts colleges offering a Fire Science program, the average student has between 0 to 5 years in the fire service, and is nowhere near a management or mid-management position.

At 1830 hours I went to visit and observe an Introduction to Fire Protection class instructed by Captain Tucker. I concluded my visit to the campus at 2000 hours.
Program Review
Section 1 - Mission Statement

Cape Cod Community College's Fire Science program has a clear and publicly stated purpose consistent with all three Fire program option missions, and is appropriate to an institution granting post-secondary degrees in a fire-related/emergency medical field of study.

Although Cape Cod Community College is accredited by the New England Association of Schools and Colleges, the Fire Science option and Fire Officer Development Certificate are not directly accredited by a regional or institutional accrediting organization, or state sanction, such as the International Fire Service Accreditation Congress (http://ifsac.org).

The Massachusetts Office of Emergency Services within the Massachusetts Department of Public Health accredits the Emergency Medical Services option.
Section 2 - Human Resources

Part 1. Faculty

Currently, the Fire Science program does not have a sufficient number of faculty to implement future (growth) program objectives.

The Fire Science program at Cape Cod Community College is an evening program and receives no state support. Part-time instructors staff the program, (with the exception of the Hazardous Materials instructor, who is a full time instructor in the Chemistry Department). One of the part-time instructors also acts as part-time coordinator. This coordinator receives nominal compensation for these duties. Compensation for the part-time instructors is stated in the collective bargaining agreement.

The addition of one full-time faculty member who would carry a four-course teaching load in addition to coordination duties would allow the fire science option and emergency medical options to expand. If this is not possible at this time, than a half-time faculty member with two-course teaching load/coordination duties should be funded. The duties, responsibilities, and workload for this position should be defined prior to implementation.

There should be published policies to protect the rights of faculty and staff in regard to academic freedom.

There should be published policies that prohibit faculty or staff from having financial or other interest that conflict with the proper discharge of their duties.

Part 2. Professional Development and Continuing Education

I did not identify any documented formal system of faculty training and orientation, other than annual adjunct faculty orientation sessions. A system for professional and personal development should be available for Fire Science faculty. They should receive ongoing professional opportunities to increase knowledge and skill in technical and educational areas (i.e. PowerPoint, Blackboard, and other presentation skills). In-service programs for faculty should be offered and held regularly to promote individual and professional development and program improvement.

In my review of the resumes of the program’s part-time faculty, I found that only one has a Graduate degree, Captain Tucker. The remainder of the part-time faculty should be encouraged to further their education. This could be done by tuition reimbursement and/or stipend.

I would also recommend that the college sponsor faculty attendance at national conferences such as the International Fire Chiefs Association’s “Hazardous Materials Response Teams Conference”, “Fire Rescue International Conference”, “Firehouse World Exposition and Conference” or “Fire Department Instructors Conference".
Attendance at these conferences will allow the program’s faculty to grasp new ideas in specific areas, as well as observing the latest technology.

The National Institute of Standards and Technology in Gaithersburg, MD also holds an “Annual Fire Conference” covering such subjects as firefighting technology, codes standards and egress, and fire/structure interaction.

The U.S. Fire Administration’s National Fire Academy in Emmitsburg, MD conducts specialized training courses and advanced management programs of national impact. Fire Service Instructors are a targeted group for this training.

Instructor education and expertise obtained through attendance at these courses and conferences will assure a high quality learning experience for the fire science student throughout all phases of the program.

Part 3. Hiring and Selection

A documented formal system for selecting faculty should be created (if it does not currently exist), to ensure top-quality instruction. Qualifications should be based on a combination of education, professional and teaching experience. The Fire Science Program Administrator and Advisory Committee should play a role in the selection of both part-time and future full-time faculty.

Part 4. Evaluation of Faculty

I did not find any performance or instructional evaluation documentation in my packet for review. This may be covered under the collective bargaining agreement.

Part 5. Staff and Support Services

There was no reference to secretarial and clerical staff to assist the part-time instructors in preparation and processing of materials, correspondence, and records. I presume the instructors have access to Continuing Education staff for these services.

I also presume that the college provides support services including student recruitment, admission activities, career placement and guidance assistance.
Section 3 - Physical Resources

Part 1. On-Campus Instructional Space

In my tour of the campus, I observed that adequate classroom instructional space was available to achieve stated objectives for the Fire Science and Fire Officer Development Certificate programs. The classrooms used by Fire Science classes appeared to be appropriately equipped with “smart” technology including digital projection and Internet access for effective instruction.

The Emergency Medical Services program needs more classroom/laboratory space. These spaces should be large enough for use in demonstrations and supervised practice of techniques. The location of classrooms or laboratories for teaching psychomotor skills such as those needed by Paramedics and EMTs should allow for flexibility in course scheduling so that each student acquires enough practice to become competent.

The Fire Science Program Administrator should periodically assess the classroom and laboratory spaces and make appropriate recommendations for modification to facilities.

The Fire Science Program Advisory Committee should also be involved in the evaluation of facilities.

Part 2. Off-Campus Instructional Space

The Fire Science Department should investigate the feasibility of offering classes at adequate off-campus facilities.

The use of the college’s Main Street Hyannis facility, as well as locations in the Plymouth/Wareham/Bourne, Orleans/Eastham area should be considered. The location selected should be compatible with the instructional needs of the program.

Looking at a map of the Cape, a location in Bourne could draw students from the surrounding four communities of Plymouth, Wareham, Falmouth, and Sandwich. Likewise, an Orleans location could draw from Chatham, Harwich, Brewster, Eastham, Wellfleet, Truro and Provincetown. Perhaps a working arrangement between the Cape Cod Community College and a fire station with a classroom/meeting room could be located in these areas. Bourne’s new fire station in the Sagamore Beach area is going to have a classroom. I am not sure of the Orleans Fire facility.

Offering classes at these locations has the potential of increasing overall student enrollment in the Fire Science program.

The Program Administrator and Advisory Committee should be involved in the evaluation of any off-campus facilities; periodically assessing the facilities to ensure it continues to meet the instructional needs of the program.
Part 3. Office Space

Office space for the Fire Science faculty is non-existent. At least one adequate office should be provided for the part-time faculty/coordinator to share, to conduct college or confidential student business, store instructional materials and prepare for classes.

Part 4. Instructional Equipment, Supplies, and Materials

During the tour of the campus, it appeared that adequate equipment and supplies were available in classrooms and laboratories to effectively achieve educational goals.

Space for the storage of Emergency Medical Services equipment, supplies, and materials appeared to be insufficient.

The Program Administrator and Advisory Committee should periodically assess the instructional equipment, supplies, and materials and make appropriate recommendations for their modification or replacement.
Section 4 - Learning Resources

Part 1. Library Resources

The library should include a wide range of resource and research materials available for utilization by students and faculty.

In my review of the Library holdings, I noted that many of the fire publications were old, and should be supplemented with newer editions. Although older publications may be of some use for historical research, one publication that really stood out was the NFPA’s Fire Protection Handbook, 15th Ed. The edition in the Library is 30 years old. The latest edition (19th) was published in 2003 as a two volume set. It is also available in electronic format. This book is a research staple for both students and instructors. The Library should also obtain an electronic subscription (CD) to NFPA’s National Fire Codes.

The Fire Science faculty and Advisory Committee should periodically review and select current titles for acquisition.

Part 2. Tutorial Resources

It was noted in the Fire Science Academic Program Review that very few students use support services, (advising, financial aid, career services, tutoring) or have ever attended an orientation. Many of them may be unaware that such services are available due to the very nature of evening continuing education students. Fire Science instructors should note these services during any orientation the first session of class.
Section 5 - Organization

Cape Cod Community College’s structure is such that the fire related degree program is recognized. There are opportunities for program faculty to be represented on all committees, groups, or organizations concerned with the development, implementation, evaluation, and revision of program curriculum.

Part 1. Program Administration

The Program Administrator for the Fire Science program has the authority, responsibility, and privileges necessary to manage the program to ensure the attainment of program goals, and appears to be provided with time for program operation, supervision, evaluation, and revision.

The college should create a detailed job description for the Program Administrator if one does not already exist.

Part 2. Planning and Budgeting

Short and long range planning for the Fire Science/Emergency Medical Program by the Program Administrator should include input from the faculty with the assistance of the Fire Science Coordinator and Fire Science Program Advisory Committee.

The Program Administrator should develop the Fire Science/Emergency Medical program budget following a formal budget process, with input and assistance from the Fire Science Coordinator and Fire Science Program Advisory Committee. There should be adequate provision for updating equipment in response to changing practices in technology.

Part 3. Advisory Committee

The Fire Science Program Advisory Committee should provide an active mechanism for liaison with the community served by the degree program and be representative of the population served.

The Fire Science Program Advisory Committee should be involved in approving all master course syllabi and in the process of creating program outcomes.

There should be written documentation that details the membership, role, function, terms and sub-committees of the Fire Science Program Advisory Committee. There should be published policies that prohibit members of advisory committees from having financial or other interest that conflict with the proper discharge of their duties.

The Fire Science Program Advisory Committee should consider expansion by adding two of three current Fire Science/Emergency Medical students. This would provide the Advisory Committee with a student’s point of view.
To be considered for membership, students should be currently enrolled in a class and matriculated into the program. Their term should cease if they are not currently enrolled or upon their graduation.

Fire Science Program Advisory Committee meeting minutes should be kept and available for five years.
Section 6 Course And Program Content

Part 1. Program Documentation

The Fire Science/Emergency Medical curriculum includes written master course syllabi (Academic Program Review Tab 1). Each master course syllabi has a list of specific instructional objectives and an outline for instruction to achieve the goals and objectives. Evaluation procedures designed to assess students are identified on each master course syllabi. Each master course syllabi has written learning outcomes that successful students will possess upon completion of the program of study.

I believe under the current MCC/DCE Collective Bargaining Agreement that the Division Dean/Program Administrator must be provided at the beginning of the semester with a current course syllabus for each course being taught to during the semester, and reviewed to a checklist for syllabi content.

Part 2. Program Content

Cape Cod Community College's Fire Science/Emergency Medical Service Program content includes areas such as fire protection, codes and ordinances, fire prevention, fire tactics and strategy, building construction, hazardous materials, emergency medicine, fire department management, fire investigation, technical rescue, fire protection systems and other fields or sub-fields as deemed appropriate by the college, with input of the Fire Science Advisory Committee.

The principles of lifelong learning are integrated throughout the Fire Science and Emergency Medical curriculum as described in the Academic Program Review, Section IV - 12 - pages 40 + 41.

Both the Fire Science and Emergency Medical Service curriculum follow a logical sequence.

One thing that I find restrictive in the program is the amount (11) of required Fire Science courses. All parties involved (Program Administrator, Fire Science Program Advisory Committee, Fire Science Coordinator and faculty), should take a hard look at the program as it now exists and compare it to the Fire and Emergency Services Higher Education (FESHE) conference Model Fire Science Curriculum which can be downloaded free of charge.

The FESHE identifies six core associate-level courses in the model curriculum, including:

- Building Construction for Fire Protection
- Fire Behavior and Combustion
- Fire Prevention
- Fire Protection Hydraulics and Water Supply
• Fire Protection Systems
• Principles of Emergency Services

The FESHE developed standard titles, descriptions, outcomes, and outlines for each of the six core courses. The major publishers of fire-related textbooks are committed to writing texts for some, or all, of these courses.

Fire Science associate degree programs are encouraged to require these courses as the "theoretical core" on which their major is based. The course outlines address the need for a uniformity of curriculum and content among the fire science courses within the United States' two-year programs.

The National Fire Science Curriculum Committee (NFSCC) also developed similar outlines for other courses that are commonly offered in fire science programs. If a school offers any of these "non-core" courses, it is suggested these outlines be adopted, as well. The non-core courses are:

• Fire Administration I
• Occupational Health and Safety
• Legal Aspects of the Emergency Services
• Hazardous Materials Chemistry
• Strategy and Tactics
• Fire Investigation I
• Fire Investigation II

Reducing the number of required classes and substituting Fire Science electives would decrease the average time to complete the degree, decrease the chance of having to take a Directed Study due to a cancelled class, and increase the number of Fire Science graduates. It would also allow for students to concentrate studies into different tracks: Fire Officer/Management, Arson Investigation, Fire Inspector, Technical Specialist

Part 3. Course Content

Course content as described in student learning outcomes, (Academic Program Review Tab 1), appears to stress problem identification and solution, with emphasis on a quantitative, analytical approach.

Simulations of real life encounters and ‘hands-on’ activities as found in Emergency Medical Technician/Paramedic, Introduction to Technical Rescue, and Shipboard Firefighting, provide an integrated educational experience allowing students to apply pertinent knowledge to the solution of practical problems.
Fire Science/Emergency Medical Faculty should be formally represented on any committees, groups, or organizations concerned with the development, implementation, evaluation, and revision of program curriculum.

Part 4. Awarding Credit For Prior Learning Or Experience

A review of the Academic Program Review document had no mention of awarding credit for prior learning or experience. In checking Cape Cod Community College’s web site I was able to locate the college’s policy on “Challenge of Courses for Credit”. It states that “any student who wishes to earn college credit for lifetime experiences by demonstrating proficiency in the content of a course may request a course challenge through the faculty advisor or counselor” according to the listed policy. “Credits relating to areas of non-traditional education will be accepted only if approved by the faculty of the appropriate academic department”.

In discussion with Captain Tucker, my impression was that credit for prior learning or experience was not granted very often. He mentioned that students with prior learning or experience were permitted to by-pass the Introduction to Fire Protection class, but students were required to substitute another 3 credit Fire Science class for it. The net gain for the student is zero.

Cape Cod Community College requires students to complete at least 30 credits at the institution in order to earn a degree.

By awarding of credit for prior learning or experience, the program could increase enrollment. For instance, many community colleges in the State award 3 credits for Introduction to Fire Science (Protection) if the student has completed the Massachusetts Firefighting Academy’s recruit program. Awarding credit for this course would bring the new firefighter into the program. Credit for Hazardous Materials is granted if the student has completed the Massachusetts Firefighting Academy’s 160 hour Hazardous Materials Technician course. Other learning venues such as attendance in classes at the National Fire Academy or Massachusetts Firefighting Academy are also given consideration for credit.

Any prior learning or experience when considered for credit should be verified and related to the degree being sought.

Part 5. Independent Study

The Fire Science/Emergency Medical curriculum includes provisions for independent study under the college’s general guidelines. A student may pursue an independent study project that must be approved by the student’s faculty advisor, as well as by the faculty member who will present the project to the appropriate department. This would fit together with the Special Topics in Fire Science course.

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The Special Topics in Fire Science course is also a good way for faculty to try out a new course offering before taking it to the Fire Science Program Advisory Committee, Curriculum Review Committee, etc. for inclusion into the program.

Part 6. Directed Study

Allowing Directed Study could increase the graduation rate of Fire Science students. Directed Study can be used to assist students who need a required course to graduate that has been cancelled or not offered in that particular semester. Faculty conducting Directed Study classes should ensure that the educational experience would be similar to that of conventional classroom instruction.

The expansion of the Fire Science program from evenings into days, both morning and afternoon, offering intersession classes, and Saturday morning classes might alleviate the problem of students that need a required course.

Part 7. Cooperative Education/Internship

One of the topics of discussion at the 1600-hour meeting in the library with the Program Review Team was the development of some type of internship and hands-on segment to the program. If the opportunity for experiential learning exists, the faculty should implement a mechanism for planning, supervising, and evaluating any cooperative education.

The Fire Science Program Advisory Committee should work with faculty to find and develop Cooperative education/Internships.

Retired Chief Newman, (during my 1600 hours meeting with the Program Review Team), suggested cooperation/internship between the Barnstable Fire Academy and the Fire Science Program. Students could assist Academy instructors during lessons and participate in Academy programs. Chief Newman felt this could provide a hands-on segment to the program.

Part 8. Instruction

Reviewing the Selected Instructor Course Materials (Tab 2) it appears that all students receive comparable instruction in the program and that a course syllabus is provided to students at the beginning of each course.

Sufficient expendable materials should be available to accomplish learning outcomes defined in program documents.

The Program Administrator and Fire Science Coordinator should make reasonable accommodations of student needs in scheduling of required courses. If this is not always possible, the student should be offered a Directed Study.
Part 9. Student Assessment

The Selected Instructor Course Materials (Tab 2) demonstrates that student assessment criteria and procedures have been developed to assess course objectives and learning outcomes.

Student assessment criteria are predetermined, consistent and communicated to students in the course syllabus. On the basis of designated criteria, both students and faculty should be able to periodically assess progress in relation to the stated objectives.

Student assessment is conducted via quizzes (Prof. Melanson's classes) and midterm examination (Prof. Tucker) to provide a feedback mechanism for the student.

Psychomotor assessment methods such as those found in the Emergency Medical classes should provide evidence of student progress toward attainment of competence in performing practical procedures. (No Emergency Medical course materials were provided for my review).

Part 10. Course Evaluation

On the basis of designated criteria, students, faculty and the Fire Science Program Advisory Committee should periodically assess course material. Course evaluation should include evaluation of the facilities and evaluation of instruction.

Part 11. Outcomes Assessment

The Fire Science Program has an ongoing outcomes assessment process that is measured and documented, as demonstrated in the Academic Program Review (Section III: Program/Student Outcomes – 7. Provide evidence that employers are satisfied that graduates of the program have the skills and abilities to function as competent employees).

The outcomes assessments survey should be performed on a regular basis and applied to the further development and improvement of the program.

Survey outcomes rated as poor should be followed up by the Fire Science Coordinator to determine its relation to the program.

Part 12. Needs Assessment/Surveying

A needs assessment as verified in the Academic Program Review (Section II: - 1, 3, 4, 5, 6, Section IV – 1) should be a major component in changing curriculum and a major component in establishing new programs or options. The program should maintain surveys of graduation rates and employability of students.
Part 13. Continuation Of Formal Education
Cape Cod Community College’s Fire Science/Emergency Medical curriculum appears to be designed to provide maximum opportunity for students to continue their formal education with a minimum loss of time and duplication of learning experiences.

According to the Academic Program Review (Section VI – 3), there are no formal Fire Science Articulation agreements with any four-year colleges or universities such as Anna Maria College, Salem State College or Worcester Polytechnic Institute. Articulation agreements should be established with a 4-year Fire Science and Emergency Medicine baccalaureate level degree program to provide for maximum transfer of related course work.

Cape Cod Community College’s web site does list a number of state-supported universities or four-year colleges in Massachusetts under the Commonwealth Transfer Compact offering a baccalaureate degree that will accept the transfer of credits earned in an Associate Degree program from Massachusetts’s community colleges under certain requirements. Cape Cod Community College also has formal articulation agreements designed to allow graduates to enter selected colleges and universities as juniors.

Summary Points

1. Need for one full time or half time faculty.
2. Encourage faculty development – attendance at national conferences.
3. Encourage faculty to get Master’s degree.
4. Fire Science Advisory Committee should be involved in faculty hiring process.
5. Fire Science Advisory Committee and Fire Science Coordinator should be involved in planning and budget preparation.
6. Fire Science Advisory Committee should work with faculty to develop Cooperative education/Internships.
7. Fire Science Advisory Committee should be involved in campus classroom review as well as off-site classroom review.
8. Faculty and Advisory Committee should periodically assess course material.
9. Faculty and Advisory Committee annually review library holdings recommend new acquisitions.
10. Expand Fire Science Advisory Committee by adding 2 or 3 current students.
11. Need for Office Space.
12. Remote off-campus instructional space should be utilized to increase enrollment.
13. Expand program into days: morning, early afternoon, Saturday mornings, and intersession.
14. Offer independent study, directed study, credit for prior learning, on-line courses.
15. Reduce number of required Fire Science courses, replace with fire science electives.