ACKNOWLEDGEMENTS

This Fire Science program review document was approved by a subcommittee of the Fire Science Advisory Committee:

- Chief Rick Ansel, Kirkwood Volunteer Fire Department
- Assistant Fire Management Officer Steve Burns, Lake Tahoe Basin Management Unit
- Chief Lorenzo Gigliotti, South Lake Tahoe Fire Department
- Chief Guy LeFeve, Tahoe-Douglas Fire Protection District
- Chief Jeff Michael, Lake Valley Fire Protection District
- Assistant Chief Van Ogami, Tahoe-Douglas Fire Protection District
- Chief Chris Sauer, Fallen Leaf Fire Department
- Division Chief Marty Scheuerman, South Lake Tahoe Fire Department
- Battalion Chief Brad Zlendick, Lake Valley Fire Protection District

Special recognition is given to Aaron McVean, Director of Institutional Research, for his assistance in obtaining and analyzing the Fire Science data found in this report.
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FIRE SCIENCE
PROGRAM REVIEW REPORT
EXECUTIVE SUMMARY

PHILOSOPHY AND MISSION
The Lake Tahoe Community College Fire Science program is committed to providing an
exemplary educational experience centered on the highest academic standards. The program is
designed to give students the required knowledge to pursue entry-level municipal or wildland fire
service careers and seeks to prepare students for lifelong roles as productive citizens and critical
thinkers.

GOALS AND OBJECTIVES
In order to fulfill our mission, the Fire Science program is committed to the following goals and
objectives:

1. Provide the foundation required for entrance into a fire service career or for transfer to a four-
year college or university.

2. Present contemporary in-service training for currently employed or volunteer firefighters.

3. Develop firefighters who will be able to serve as leaders and positive role models in the
community.


FINAL RECOMMENDATIONS
The program review study has identified the following non-prioritized recommendations to
further improve the quality and effectiveness of the Fire Science program at Lake Tahoe
Community College:

(1) Begin the assessment process for the Fire Science student learning outcomes (SLOs) in
accordance with the college's procedures and deadlines.

(2) Monitor the workload associated with the Fire Academy Coordinator position and
increase weekly hours as feasible.
(3) Monitor the Fire Academy schedule change to a Saturday/Monday format to assess availability of adjunct instructors and the ability of the fire agencies to support the Academy in terms of equipment, supplies, and facilities.

(4) Continue to look for grant funding to support the acquisition of supplies, instructional equipment, and dedicated classroom space.

(5) Ensure that California State Fire Marshal accreditation standards as a Regional Training Program are maintained.

(6) Continue to recruit women and diverse students into the program.

(7) Add Emergency Medical Technician (EMT) certification as a prerequisite to Fire Academy courses.
A. PROGRAM PHILOSOPHY AND MISSION

The Lake Tahoe Community College Fire Science program is committed to providing an exemplary educational experience centered on the highest academic standards. The program is designed to give students the required knowledge to pursue entry-level municipal or wildland fire service careers and seeks to prepare students for lifelong roles as productive citizens and critical thinkers.

B. PROGRAM GOALS AND OBJECTIVES

In order to fulfill our mission, the Fire Science program is committed to the following goals and objectives:

(1) Provide the foundation required for entrance into a fire service career or for transfer to a four-year college or university.

(2) Present contemporary in-service training for currently employed or volunteer firefighters.

(3) Develop firefighters who will be able to serve as leaders and positive role models in the community.

(4) Maintain currency with curriculum, Student Learning Outcomes, and assessment.

C. RESPONSE TO RECOMMENDATIONS FROM PREVIOUS PROGRAM REVIEW

This is the second program review for the Fire Science program. Eight non-prioritized recommendations were made in 2003 regarding the Fire Science program:

(1) Monitor the feasibility of offering all Fire Science courses over one academic year instead of two.
Response: The Fire Science Advisory Committee is surveyed annually regarding this issue and this group of industry experts recommends that the college continue the two year rotation of courses.

(2) Investigate expanding the curriculum to include fire service leadership courses.

Response: The Fire Science Advisory Committee now believes that students are best served by general leadership courses offered through the Business department at LTCC. The committee will contact the Director of Career & Technical Education if a leadership course that is specific to the fire service is needed.

(3) The Fire Science Advisory Committee recommends that the Fire Science Coordinator position be temporarily inactivated and revisited at future meetings.

Response: At the time this recommendation was made, the Fire Science program was relatively small and did not have the complexities associated with the Lake Tahoe Basin Fire Academy or the five instructional service agreements for local fire agencies. The CTE Programs Technician position has been converted to full-time and is augmented with a Fire Academy Coordinator quarterly stipend position. The staffing for the Fire Science program will be strengthened in 2009-2010 to include a 16-hour per week Fire Academy Coordinator. (See discussion in Section E)

(4) In accordance with student and community survey recommendations, the Fire Science program should provide for hands-on, “real life” experiences whenever possible by incorporating such activities as:
   a. Guest speakers on specialized topics
   b. Field trips to local fire departments
   c. Job shadowing opportunities

Response: All Fire Science courses have been enriched with learning activities such as those described above.

(5) The following special topics courses will be converted over to regular course status:
   • FIR133AA (Fire Instructor 1A)
   • FIR133C (Fire Instructor 1B)
   • FIR133L (Driver/Operator 1A)
   • FIR133M (Driver/Operator 1B - Pump Operations)

Response: Completed.
(6) Explore opportunities for dedicated and technologically advanced classroom space. For example, the new USFS building on the LTCC campus will be investigated as a possible lecture venue.

Response: The USFS conference room is available for wildland firefighting courses. Other classrooms on campus and at local fire stations are fundamentally adequate for Fire Science courses and their associated technology needs, but more space is needed for Fire Academy classes (see discussion in Section E). Lake Valley Fire Protection District is in the process of acquiring a portable classroom for Fire Science classes and this will undoubtedly alleviate some of the scheduling challenges related to the program. Grant funding will be used to equip this classroom with “smart” technology and fixtures. (See discussion in Section E)

(7) Fire Science instructors could benefit from additional professional development in regard to teaching skills. The instructors will be encouraged to attend an Instructional Skills Workshop (ISW) and the Director of Vocational Education will investigate the possibility of a special teaching workshop geared specifically toward Fire Science.

Response: An Instructional Skills Workshop was scheduled in 2008 for Fire Science adjunct instructors. Due to conflicting work schedules, the workshop was cancelled. Adjuncts are now reporting that that Instructor Training courses offered through the State Fire Marshal are more appropriate to meet this professional development need.

(8) Additional focus on outreach activities with a special emphasis on attracting female students and non-native English speaking students.

Response: A Fire Science and Fire Academy website was created in 2007 and prominently features non-traditional and diverse students. In addition, the Fire Academy Coordinator makes regular presentations at the high school and local service organizations. Funding has been earmarked for the development of a Lake Tahoe Basin Fire Academy brochure which will likewise focus on female students and diverse students.

D. ACCREDITATION SELF-STUDY

The November 2005 accreditation self-study and the visiting team’s evaluation report were reviewed with respect to the Fire Science program. No items were called out in either report that have direct bearing upon the Fire Science program. There was, however, a general recommendation for establishing student learning outcomes for all instructional and student support programs. This recommendation would apply to the Fire Science program and is addressed in Section J.
E. PROGRAM HISTORY AND PROJECTIONS

Enrollment Trends/FTES

As indicated below, enrollments in the Fire Science courses have greatly increased since 2003-2004. There was a slight dip in enrollments in 2005-2006 that mirrors the college-wide decrease in enrollments for that year. Significant enrollment growth started in 2006-2007 with the creation of instructional service agreements (ISAs) for five local fire agencies and the launch of the Lake Tahoe Basin Fire Academy. The ISAs accounted for 108 new students in 2006-2007 and 104 students in 2007-2008. The Fire Academy courses yielded 20 additional students (per quarter; 60 over the academic year) in both 2006-2007 and 2007-2008.

With respect to student enrollment, Fire Science is ranked as the 19th largest instructional program (out of 42 programs) on campus.

![ENROLLMENT](image)

<table>
<thead>
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<th>Year</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>04-05</td>
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</tr>
<tr>
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<td>06-07</td>
<td>335</td>
</tr>
<tr>
<td>07-08</td>
<td>389</td>
</tr>
</tbody>
</table>
Over the past five academic years, class sizes for Fire Science courses have averaged 19.4 with a range of 11 to 33. (Note: Work Experience and Internship courses have been removed from this calculation.)

Converting student enrollments to FTES (full-time equivalent students) yields the following data for the Fire Science program:

The FTES trend portrayed above mirrors the enrollment trend explained on page 4. In other words, the slight dip in FTES production in 2005-2006 is in line with the college-wide FTES decrease for that year. The substantial increases in FTES production in 2006-2007 and 2007-2008 are attributed to the fire agency ISAs and the launch of the Lake Tahoe Basin Fire Academy.
With respect to FTES, Fire Science is now ranked as the 4th largest instructional program (out of 42 programs) on campus. FTES production for the other 43 instructional programs range from a high of 260.31 (Physical Education) to a low of 2.13 (Ethnic Studies).

**Staffing (Full-Time Faculty, Adjunct Faculty, Classified Staff)**

All Fire Science classes are taught exclusively by adjunct faculty. The fire agencies served by the institutional services agreements provide qualified adjunct faculty for their associated courses.

The CTE Technician assists with coordination issues related to the Fire Science program at LTCC. This position currently receives an eleven month contract, but will be increased to twelve months in 2009-2010 through VTEA funding. This additional classified staff support is required for complex and highly regulated CTE programs such as Fire Science.

The Fire Academy Coordinator is a quarterly stipend position with an immense workload associated with ensuring that the college is in compliance with the standards for accreditation as a Regional Training Program through the California State Fire Marshal’s Office. Effective July 1, 2009, this position will be converted to a regular, part-time Classified position (16 hours/week, 40 weeks) with the support of VTEA categorical funding. The Fire Academy Coordinator is assisted by a volunteer task force comprised of local firefighters and training officers.

It is recommended that the staffing level for the Fire Academy be monitored over the next five years and hours increased if deemed necessary and feasible. The part-time Fire Academy Coordinator is responsible for scheduling approximately 12 adjunct instructors and 20 instructional aides each quarter. In addition to scheduling responsibilities, the Fire Academy Coordinator acts as the direct point of contact for the Cadets, orders uniforms and supplies, and generally ensures the effective daily operation of the program. It should be noted that this is typically a full-time position in other Fire Academies in California.

**Facilities**

The Fire Science courses are taught throughout the academic year, typically on campus or at Lake Valley Fire Protection District, Station 7, in Meyers. When the college utilizes a fire agency classroom, the agency receives a $5/hour facilities use fee. Fire agencies have historically waived the facilities use fee for Fire Academy courses.

A “semi-dedicated” classroom (G6) was recently refurbished and equipped with “smart” technology funded through a Chancellor’s Office instructional equipment grant. This classroom is also used for EMT and Dental Assisting courses. The room is crowded with equipment and storage cabinets, making it a “tight fit” for Fire Academy courses. Students enrolled in Fire
Academy classes are required to bring a large gear bag with them to every class and the limited space is extremely challenging for this unique instructional program.

Lake Valley Fire Protection District is currently in the process of acquiring a portable classroom from LTUSD. This classroom will be refurbished and equipped with “smart” technology funded through an SB-70 collaborative grant with Folsom Lake College. The acquisition of this classroom (which will remain under Lake Valley's ownership) will greatly alleviate the crowding issues described above on training days that require access to the fireground. All classroom equipment and furnishings will be properly inventoried and remain the property of LTCC. This type of community partnership with local fire agencies is allowing the Fire Science program to remain cost effective while providing adequate instructional space for our students.

The training grounds required for the effective operation of the Fire Academy are considerable and include several locations throughout the county, depending on the training topic and equipment needs. These locations include the burn tower at Lake Valley Fire Protection District Station 7, all Lake Valley and South Lake Tahoe Fire Department stations, and a large hangar at the South Lake Tahoe Airport. Classes can also be held in various locations such as lakes, rivers, or cliffs, for courses such as Ice Rescue, Swiftwater Rescue and High Angle Rescue.

The Chief for the South Lake Tahoe Fire Department is currently seeking to acquire a “floating acre” from the Lake Tahoe Unified School District in order to build a fire station on the LTCC campus. If successful, the LTCC Board of Trustees will need to grant permission to build the fire station. The SLTFD Chief is also interested in having the college seek grant or bond funding to support the building of a fire training tower for the Fire Academy on the LTCC campus. This proposal will be further discussed at the fall 2009 Fire Science Advisory Committee meeting.

**Equipment/Technology**

The Fire Science program at LTCC requires specialized equipment and technology. All of the Fire Science courses offered at the college must meet the California State Fire Marshal's standards for a Regionally Accredited Training Program. The curriculum associated with this accreditation is technologically advanced and requires access to PowerPoint and the Internet. Smart classrooms, therefore, are necessary.

In addition to smart classroom technology, the Fire Science program utilizes a great deal of instructional software that is mandated by the California State Fire Marshal's Office. For example, the college was recently required to purchase Firefighter I interactive software curriculum and associated instructor guides. The cost for this curriculum package was over $4,500. The Firefighter I curriculum is accompanied by an assessment software package ($700). These curriculum packages were funded out of the Folsom Lake SB-70 Collaborative Grant.
Instructional equipment for the Fire Science program is needed for the Fire Academy classes only. The degree and certificate courses are all lecture-based. Examples of required equipment for the Fire Academy includes protective turnout gear, self-contained breathing apparatus (SCBAs), axes, chainsaws, ladders, hoses, etc. The college has formed extremely close partnerships with our local fire agencies and these agencies have provided the vast majority of the required equipment at no cost. The epitome of this community partnership was realized in 2007 with the donation of a fully operational fire engine from Tahoe-Douglas Fire Protection District.

The college is slowly beginning to augment these equipment donations through grant funding. For example, $40,000 was recently expended for turnouts and associated safety equipment through the Folsom Lake College SB-70 Collaborative Grant. Another $45,000 is being earmarked through this grant for classroom equipment and SCBAs in 2009-2010. In general, the college expends minimal general funds on equipment and technology for the Fire Science Program.

**Supplies**

The Fire Science program at LTCC requires specialized supplies along the same lines as the instructional equipment needs described above. Again, these supplies are required for the Fire Academy courses – not the lecture-based Fire Science degree and certificate courses. Examples of supplies required for the effective operation of the Fire Academy include lumber (for building training props), axe belts and sheathes, safety goggles, etc. Whenever feasible, supplies are purchased through grant funding as previously described.

**Income/Expenses**

The Fire Science program is a very inexpensive and lucrative instructional program. Since 2003, income generated by the program has exceeded expenses by an approximate 4:1 ratio. The net income for the Fire Science program in 2007-2008 was $384,462. Expenses are very low, consisting of adjunct faculty salaries, small quarterly stipends for the Fire Academy Coordinator, ISA payments to fire agencies, and minimal supplies and equipment.

The cost of servicing one full-time equivalent student for the Fire Science program is $1,561, ranking it as the 6th lowest cost program at LTCC. This is a notable statistic considering that Fire Science is the 4th largest instructional program at LTCC in terms of FTES production. The cost per FTES for the other 41 instructional programs range from a high of $25,908 per FTES (Ethnic Studies) to a low of $357 per FTES (Home Economics), with a college-wide median cost per FTES of $2,856.
The Fire Science program is taught exclusively by adjunct faculty. Annually, LTCC offers an average of 77 units Fire Science courses which equates to 1.60 FTEF (full-time equivalent faculty). These calculations do not include courses offered through the ISAs with local fire agencies. Instructor load (or WSCH/FTEF) is a measure of the number of students a faculty member comes in contact with in class each week. It is calculated on the basis of a full-time equivalent faculty member. The instructor load for Fire Science was 150 in 2007-2008. The instructor load for the other 53 instructional programs in 2007-2008 range from a high of 403 (Economics) to a low of 85 (Home Economics). The Fire Science program currently utilizes approximately 20 adjunct instructors with various areas of expertise ranging from fire chemistry to wildland firefighting. The courses offered under the ISAs are instructed by senior Fire Training Officers at five local fire agencies.

**F. CURRICULUM**

The curriculum for the Fire Science program is reviewed each year by an extremely active Advisory Committee. The committee believes that the curriculum is solid and reflects the needs of fire service professionals in our region and the state of California. The Advisory Committee also affirms that the breadth of course offerings within the program is appropriate and consistent within the mission of a community college. All Fire Science courses are regularly updated and reviewed for compliance with Title V requirements.

The Fire Science program has recently been redesigned to meet California State Fire Marshal standards as a Regionally Accredited Training Program and now consists of the following active courses:

**Fire Science AA Degree**

**A. General Education Requirements**

**B. Required Courses**

31.5 – 32.5 units distributed as follows:

1. All courses from the following:
   
   FIR101  Fire Protection Organization (formerly FIR151)
   
   FIR102  Fundamentals of Fire Prevention (formerly FIR152)
   
   FIR103  Fire Protection Equipment and Systems (formerly FIR159)
FIR104  Building Construction for Fire Protection (*new course*)
FIR105  Fire Behavior and Combustion (formerly FIR160)
FIR106  Principles of Fire and Emergency Services Safety & Survival (*new course*)

2. Choose a minimum of 7.5 units from:

   FIR153  Fire Hydraulics
   FIR167  Wildland Fire Safety & Hand Crew Operations
   HEA141  Emergency Medical Technician I

The Fire Science certificate of achievement consists of the same courses, with the exception of the general education requirements.

In addition to the Fire Science AA degree and certificate of achievement, a new certificate of achievement was created in 2008-2009: Firefighter I. The Firefighter I Certificate of Achievement program is designed to prepare students for careers as entry-level firefighters and emergency medical technicians. The program provides students with the knowledge and skills required to become certified as a Firefighter I by the California Board of Fire Services (CBFS). In order to complete their official state certification from CBFS, students need to document one year of volunteer service or six months of paid service as a firefighter in California. The Firefighter I certificate consists of the following required courses (43.5 units):

   FIR170A  Lake Tahoe Basin Fire Academy, Part 1 (10.75 units)
   FIR170B  Lake Tahoe Basin Fire Academy, Part 2 (12.75 units)
   FIR170C  Lake Tahoe Basin Fire Academy, Part 3 (11.50 units)
   HEA141  Emergency Medical Technician – I (8.50 units)

Receiving accreditation as a Regional Training Program through the California State Fire Marshal’s Office required the formalization of eleven Fire Officer courses. Curricula for these courses are specified by the State Fire Marshal’s Office. The eleven courses are:

   FIR171A  Fire Command 1A
   FIR171B  Fire Command 1B
   FIR171C  Fire Command 1C
   FIR172A  Training Instructor 1A
   FIR172B  Training Instructor 1B
   FIR172C  Training Instructor 1C
   FIR173A  Fire Investigation 1A
FIR174A  Management 1A
FIR175B  Fire Prevention 1B
FIR176   Intermediate Command System

Additional courses are offered in specialized areas and are scheduled on an “as needed basis” according to local fire agency demand. These courses include:

FIR180A  S-205 Fire Operations in the Urban Interface
FIR180B  S-270 Basic Air Operations
FIR180C  ICS 100/200/300 – Incident Command System
FIR180D  S-290 Intermediate Wildland Fire Behavior
FIR180F  Driver Operator 1A
FIR180G  Driver Operator 1B

As mentioned previously, LTCC currently has instructional services agreements (ISAs) in place with five local fire agencies (Lake Valley Fire Protection District, South Lake Tahoe Fire Department, Tahoe-Douglas Fire Protection District, Meeks Bay Fire Protection District, and Kirkwood Volunteer Fire Department). A sixth ISA for Fallen Leaf Volunteer Fire Department has just received Board approval and will be launched in 2009-2010. The courses offered under the ISAs include:

FIR161A  In-Service Training for Firefighters, Module A
FIR161B  In-Service Training for Firefighters, Module B
FIR161C  In-Service Training for Firefighters, Module C
FIR161D  In-Service Training for Firefighters, Module D
G. SCHEDULING OF CLASSES AND/OR AVAILABILITY OF SPACE

The courses required for an AA or certificate of achievement in Fire Science may be completed within a two-year time period. The required and elective courses are offered on a regular two-year schedule and have not been canceled due to low enrollments in the last ten years. A few students have expressed a desire to complete the Fire Science course sequence in one year instead of two (see Student Survey results, Section F), but the Fire Science Advisory Committee believes this schedule could potentially jeopardize the class size stability that the program currently experiences. In other words, classes could be canceled due to lower student enrollments. Following is the current two-year plan for the Fire Science program.

<table>
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<tr>
<th>Course #</th>
<th>Title</th>
<th>2009-2010</th>
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</table>

All Fire Science “core” classes are scheduled in the evening; typically one night per week in four-hour blocks. A recent survey of Fire Science students indicates that 90% believe this schedule is convenient (see Section J).

Fire Academy courses (FIR170A, FIR170B, and FIR170C) are currently scheduled for Tuesday and Thursday evenings (6:00 – 9:50 p.m.) and all day on Saturdays (8:00 a.m. – 4:50 p.m.). The task force that coordinates the Fire Academy has recently conducted a fire agency and student survey to determine whether this schedule is convenient in terms of fire service operational issues and student employment schedules. Based on extensive research and feedback, the Fire Academy schedule will be changed to all day on Saturdays and Mondays (8:00 a.m. – 4:50 p.m.), effective 2009-2010. Surveys distributed to the local Fire Chiefs and Training Officers (see Section J) reflect mixed support for this schedule change. It
is therefore recommended that the transition to a Saturday/Monday schedule for the Fire Academy be monitored in 2009-2010 to determine if there is an adverse impact on adjunct instructor availability or the ability of the fire agencies to support the Academy with equipment, supplies, and facilities.

A discussion regarding the availability of space for Fire Science courses is found in Section E. Fire Science courses require access to “smart” classroom technology due to the mandated California State Fire Marshal’s Office curriculum. The on-campus classrooms are generally sufficient for the Fire Science “core” courses (i.e., the courses required for the Fire Science degree and certificate of achievement). The Fire Academy courses are challenged by the issues described in Section E.

H. DOCUMENTS

The following documents were reviewed in conjunction with the program review process for the Fire Science program:

1. College Catalog

- **Course Descriptions:** A review of these descriptions indicates that they reflect the content of the courses as they are taught at this time. *(All Fire Science courses are on a regular review cycle.)*

- **Prerequisites:** The courses required for the Fire Science degree and certificate of achievement do not have prerequisites. Three of the four Firefighter I certificate courses have prerequisites that ensure students are academically prepared and meet commonly accepted standards for safely participating in the courses. Firefighter I courses with prerequisites in place include:

  FIR170B  Lake Tahoe Basin Fire Academy, Part 2 *(prerequisite is successful completion of FIR170A)*

  FIR170C  Lake Tahoe Basin Fire Academy, Part 3 *(prerequisite is successful completion of FIR170B)*

  HEA141  Emergency Medical Technician, I *(prerequisites include CPR and First Aid certification, as required under Title 22)*

The Fire Academy task force is recommending that EMT certification be added as a prerequisite to FIR170A (Lake Tahoe Basin Fire Academy, Part 1), effective 2010-2011. Committee members firmly believe that students need EMT certification in order to safely participate in the required ride-along experiences that take place in FIR170A, FIR170B, and FIR170C.
• **Graduation Requirements:** The current requirements for earning an AA degree in Fire Science address general education requirements. These graduation requirements are sufficiently broad to ensure a general understanding of the Fire Science profession.

2. **Quarterly Schedules**

• **Fire Science Class Listings:** The descriptions of Fire Science classes in the quarterly schedules have been reviewed and are appropriate to the courses being taught at this time. They are similar to the catalog descriptions. To date we have had no known confusion from students about the scheduling of Fire Science classes.

3. **Counseling Materials**

• **Brochures:** There are “rack cards” available in Student Services that contain job descriptions and labor market data. VTEA and Tech Prep funding was targeted in 2004-2005 to translate the vocational education "rack cards" into Spanish. This is assisting with outreach initiatives aimed at non-native English speaking students. In addition to the rack cards, the CTE department produces a Fire Academy Program Announcement flyer on a yearly basis that is widely distributed on campus. This flyer describes the program requirements and advertises the yearly mandatory orientation meeting that is typically held in August.

• **Counseling Sheets:** Each year the Counseling department works with faculty and administrators to review and revise the counseling sheets. These sheets list the requirements for each degree and certificate in the discipline and are referenced extensively by students and counselors alike. The Fire Science counseling sheets are up-to-date and reflect the requirements as they stand at this time.

4. **LTCC Website**

The Lake Tahoe Community College website information for Fire Science was improved in 2005-2006 to include career preparation information and links to relevant agencies and certifying bodies. The Fire Science website was significantly augmented in 2007-2008 to include a link to information specific to the Lake Tahoe Basin Fire Academy.
I. Student Demographics

- **Gender.** The most recent publication of "Graphically Speaking" indicates that the current college-wide ratio of female to male students is 56% to 44%. The female to male ratio for students in the Fire Science program is 10% to 90%. This statistic is indicative of the male-dominated Fire Science profession. Recruiting efforts are currently underway to improve the participation of women in the Fire Science program.

- **Age.** Campus-wide, the average age for all students is 35.5 years. The "typical" Fire Science student is slightly younger than this college average (34 years old). Again, this statistic is probably reflective of the Fire Science profession as a whole. With the addition of the Fire Academy, it is predicted that the average age of Fire Science students will decrease over the next five years as young men and women seek the certification needed to become entry level firefighters.

- **Ethnicity.** The following comparisons are made between Fire Science students and students at LTCC campus-wide for 2007-2008. The Fire Science program attracts primarily Caucasian students. Aggressive recruiting efforts are currently underway to attract a more diverse student population to the Fire Science program.

<table>
<thead>
<tr>
<th></th>
<th>Campus-Wide</th>
<th>Fire Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native American</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Asian</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>African American</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>White</td>
<td>70%</td>
<td>82%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>15%</td>
<td>5%</td>
</tr>
<tr>
<td>Filipino</td>
<td>1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>11%</td>
<td>9%</td>
</tr>
</tbody>
</table>

- **Full-Time/Part-Time Status.** Campus-wide, 87% of our students are part-time while 13% are considered full-time. In the Fire Science program, 62.5% of the students are part-time and 37.5% are full-time.

![Full Time vs. Part Time Students](chart.png)
J. STUDENT LEARNING AND SUCCESS

Degree and Certificate Completions

The Fire Science program is designed as a two-year course of study culminating in an AA degree or two different certificates of achievement (Fire Science and Firefighter I). A five-year history of Fire Science degrees and certificates awarded annually is presented below:

<table>
<thead>
<tr>
<th>Certificates</th>
<th>Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-2008</td>
<td>1</td>
</tr>
<tr>
<td>2006-2007</td>
<td>2</td>
</tr>
<tr>
<td>2005-2006</td>
<td>1</td>
</tr>
<tr>
<td>2004-2005</td>
<td>7</td>
</tr>
<tr>
<td>2003-2004</td>
<td>5</td>
</tr>
</tbody>
</table>

As the table above indicates, the Fire Science degree and certificate programs are “healthy” in terms of completion rates. Since 2004, 18 students have earned AA degrees and 16 students have earned certificates.

As mentioned in Section E, enrollments in Fire Science courses are very steady, and may be considered close to average for the college (19th largest of 42 instructional programs). Because of the vocational nature of many of the courses, some students are simply interested in getting the initial training or continuing education they need in their fire service careers.
Course Completions

A review of Fire Science courses taught over the past five academic years (2003-2004 through 2007-2008) shows an average course completion rate of 83.32% (range = 77.30 - 81). This is significantly higher than the campus average of approximately 74.46 in 2007-2008. ("Completion" is defined as the number of courses students complete with an A, B, C, or CR grade.)

![Successful Completion %](image)

Update on Student Learning Outcomes

Student learning outcomes (SLOs) are the essential knowledge, skills, competencies, and abilities that a student will gain as the result of his or her engagement in a particular course, program, or college service. To ensure that the goal of preparing students for fire service careers is achieved, student learning outcomes (SLOs) for the Fire Science program match the skills required to obtain an entry-level position as a firefighter. The curriculum and course sequencing of the program have been designed to ensure that students achieve these SLOs. All Fire Science courses have been submitted to the SLO committee for formal review and approval in 2008-2009. Work is currently underway to develop an assessment plan for Fire Science SLOs in 2009-2010.

The following are the existing Fire Science program SLOs that have been approved by the college's SLO and Curriculum Committees and will be published in the 2009-2010 college catalog.
Fire Science Program
Student Learning Outcomes

Upon successful completion of the Fire Science degree or certificate of achievement, students will:

1. Identify minimum qualifications and entry-level skills for firefighter hiring.

2. Analyze, appraise and evaluate fire and emergency incidents and identify components of emergency management and firefighter safety.

3. Comprehend laws, regulations, codes and standards that influence fire department operations, and identify regulatory and advisory organizations that create and mandate them, especially in the areas of fire prevention, building codes and ordinances, and firefighter health and safety.

4. Analyze the causes of fire, determine extinguishing agents and methods, differentiate the stages of the fire and fire development, and compare methods of heat transfer.

5. Identify and describe common types of building construction and conditions associated with structural collapse and firefighter safety.

6. Differentiate between fire detection and fire suppression systems.

Other Measures of Student Success

Course sequence and term persistence data for the Fire Science program are not currently available. Adjunct instructors report that approximately 50% of the students in any given course have taken previous Fire Science courses.

Data is currently not available regarding job placement for our students. Anecdotally, we are aware of a number of students completing their AA degree or certificate and obtaining positions as entry-level municipal and wildland firefighters. Data does not exist for specifically tracking Fire Science students who transfer to four-year colleges or universities. Each year the Fire Science Advisory Committee reviews the program’s curriculum for adherence to current industry standards and answers three questions mandated by the California Community Colleges System Office:
1. *Does the program meet a documented labor market demand?* The committee consistently answers “yes” to this question. There are definitely positions available for program graduates. Continuing education needs are being met and the AA degree is an essential “stepping stone” toward the Bachelor’s degree (available at CSU Los Angeles).

2. *Does it represent unnecessary duplication of other manpower training in the area?* The Advisory Committee affirms that there are no other Fire Science programs in our immediate area.

3. *Is it of demonstrated effectiveness as measured by the employment and completion success of its students?* The Advisory Committee routinely answers “yes” to this question. The committee is aware of several students who have finished the program and received positions in the community or region.

**Student Survey Results**

Surveys were distributed to 83 students taking Fire Science classes during the winter and spring 2009 quarters. Fifty surveys were returned (60%). The survey results are as follows:

1. **Which classes have you taken at LTCC?**

   - Fire Academy (21)
   - Intro to Fire Technology (30)
   - Hydraulics (10)
   - Fire Chemistry (15)
   - EMT (28)
   - Wildland Firefighting (22)
   - Fire Service Operations (25)
   - Fire Investigation (15)
   - Fire Protection Systems (18)
   - Fire Prevention (20)
   - Ski Patrol (15)
   - Emergency Response (10)
   - Miscellaneous Fire Officer Courses (8)
   - General education courses (32)
   - PE classes (25)
2. What is your primary educational goal?
   - Complete the Lake Tahoe Basin Fire Academy and become a firefighter (30)
   - Certificate in Fire Science (12)
   - AA degree in Fire Science (28)
   - Transfer to a 4-year college (2)
   - Obtain EMT or Paramedic certification (22)
   - General education – AA degree (8)
   - Undecided (5)

3. Are you currently working in a fire service-related profession? (If yes, in what capacity?)
   - Yes (22); firefighter, seasonal wildland firefighter, EMT, volunteer firefighter
   - No (28)

   If you are working in a fire service-related profession, how useful is the information you receive in LTCC’s Fire Science courses?
   - Extremely useful (15)
   - Somewhat useful (5)
   - Neutral (2)
   - Not very useful (0)
   - Not useful at all (0)

4. What is your ultimate career goal?
   - Become a paid firefighter for a municipal fire department (40)
   - Become a wildland firefighter (8)
   - Become an EMT or Paramedic (2)

5. Does the sequence of Fire Science course offerings allow you to progress toward your goals?
   - Yes (32)
   - No (18)

   Comments: I would like to see courses offered more frequently. (Cited on four surveys)
6. **Is the college offering Fire Science courses at the most convenient days and times?**

Yes (45)
No (5)

Comments: More daytime classes would be nice.

7. **Please rate the Fire Science courses you have taken in terms of...**

<table>
<thead>
<tr>
<th>Quality of Instruction</th>
<th>Poor (0)</th>
<th>Average (0)</th>
<th>Good (4)</th>
<th>Very Good (45)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Content</td>
<td>Poor (0)</td>
<td>Average (1)</td>
<td>Good (6)</td>
<td>Very Good (43)</td>
</tr>
<tr>
<td>Instructor Knowledge</td>
<td>Poor (0)</td>
<td>Average (0)</td>
<td>Good (2)</td>
<td>Very Good (48)</td>
</tr>
<tr>
<td>Preparation for Career</td>
<td>Poor (0)</td>
<td>Average (5)</td>
<td>Good (8)</td>
<td>Very Good (37)</td>
</tr>
</tbody>
</table>

8. **What is your opinion of the impending changes to the Fire Science degree and certificate that will become effective fall 2009? Are you aware of the new classes that you will need to take to complete your degree or certificate? (Please see attached “cross-over” chart)**

- The changes look fine to me. (30)
- I’m happy that the new courses are certified by the State Fire Marshal. (4)
- No opinion. (14)
- Doesn’t really affect me since I’m just starting out. (2)

9. **What is ONE SUGGESTION you have for improving the Fire Science program at LTCC?**

- Keep on growing.
- More hands-on experience. (12)
- Nothing – everything is great. (22)
- Try to vary the schedule to accommodate students who have to work.
- Keep the State Fire Marshal Accreditation!
- Have some classes online. (2)
- Offer classes more than once a year. (8)
- Give Ms. Allen a raise! (7)
• More guest speakers.
• Bigger classroom. (12)
• Sharing our classroom with the dental program is simply ridiculous.

10. **Overall, how would you rate your level of satisfaction with the Fire Science program at LTCC?**

   Extremely satisfied (42)
   Satisfied (5)
   Neutral (3)
   Dissatisfied (0)
   Extremely dissatisfied (0)

11. **Additional comments?**

   • Thank you for getting the State Fire Marshal certification.
   • I like the new courses that are coming!
   • Our instructors are top-notch. I have friends taking classes at other colleges and they are very impressed to hear that we have senior fire officers teaching us!
   • The Fire Academy is the best thing that ever happened to Lake Tahoe!
   • This is such an important program for a lot of reasons.
   • Jamie (works in the voc ed office) is so nice to us! She’ll drop whatever she’s doing at night to help us!
   • Don’t change a thing.
   • Thank you for trying to make this better.
   • Chief Novak is the best instructor I’ve ever had -- and I’ve had millions.
   • I’m so impressed that this small college offers this program -- it’s great!
   • I’d like to see more advanced wildland firefighting classes.
   • Give the instructors a raise!
   • We need our own classroom.
   • Leona Allen is an incredible asset to the college. I can’t believe how hard she works and I only hope she is appreciated.
   • Loved the fire investigation class -- it was cool!
• I've been on several worthwhile fieldtrips through this program. Very informative.
• How about some classes online for a change? It's sometimes hard to get to class on time when I'm working.
• The books are too expensive.
• I'm so proud to be part of this college and the Fire Science program. It's made me grow up – which my mother appreciates!
• Will the college ever consider offering a Firefighter II program? That would be great!
• Our local firefighters and officers are awesome – I can't believe they actually teach us. I've been to Fire Tech classes at other colleges where it was some old retired dude lecturing for three straight hours and I know he hasn't worked in the field for 20 years.
• I feel important here. That's cool.
• Offer all classes twice a year so I can finish quicker!
• Pay your instructors more! They work so hard!

Community Survey Results

Surveys were emailed to nine local Fire Chiefs and Fire Training Officers to gauge their level of satisfaction with the Fire Science program at LTCC. Nine surveys were returned (100%). Following are the survey results.

1. Do you currently have any LTCC Fire Science or Fire Academy students or graduates working at your agency? If so, how many and in what capacity?

   Yes (9)

   • Approximately 10; paid and reserve firefighters
   • One Fire Academy graduate (myself) and two volunteers are currently enrolled in the Fire Academy
   • We currently have one Fire Science and one Fire Academy graduate working as paid seasonal firefighters. I am also a graduate of the Fire Science program at LTCC.
   • 12 employees with LTCC Fire Science degrees. Positions range from Firefighter/Paramedics (3), Engineers (3), Captains (3), Battalion Chief (1), Assistant Chief (1), Fire Chief (1).
   • Two wildland firefighters.
   • 11 fire handcrew members; 14 volunteer firefighters.
• 4 full-time firefighters and 14 reserves. (2 responses)

No (0)

2. On a scale of 1 (poor) to 5 (excellent), how would you rate the knowledge and experience of the instructors in the Fire Science program? In the Fire Academy?

Fire Science: Ratings – 5, 4, 5, 4, 5, 5, 5, 5, 5 (average = 4.78)
Fire Academy: Ratings – 5, 5, 4, 3, 5, 5, 5, 5, 5 (average = 4.67)

Comments:
• I know many of the instructors professionally and find them to be excellent.
• I have not taken Fire Science courses at LTCC, but it is my understanding that the instructors are very good.
• I have my AA degree from LTCC and found the instructors to be highly motivated and dedicated.
• The base knowledge of the instructors is commendable, but some instructors lack the career experience on the job, only because they have not had the benefit of time.
• Instructors in both programs have demonstrated they are subject matter experts and qualified to teach at a high level.

3. On a scale of 1 (poor) to 5 (excellent), how would you rate overall quality of instruction in the Fire Science program? In the Fire Academy?

Fire Science: Ratings – Unknown, 4, 4, 4, 5, 5, 5, 5, 5 (average = 4.63)
Fire Academy: Ratings – 5, 5, 4, 4, 5, 5, 5, 5, 5 (average = 4.78)

Comments:
• I have not attended any Fire Science classes for a few years, but find the quality of the Academy instruction to be very high.
• The enthusiasm, dedication and positive attitude of the instructors are an asset to the Fire Science and Fire Academy programs. These attributes are contagious to the students of the Academy.
• The candidates we have either hired in full-time positions or are working within the reserve program are of very good quality.
• So far we have been satisfied with the candidates we have either hired in full-time positions or as reserves.

4. **On a scale of 1 (poor) to 5 (excellent), how would you rate the career preparation students are receiving in the Fire Science program? In the Fire Academy?**

Fire Science: Ratings – Unknown, 4, 4, 3, 5, 4, 5, 4, 3 (average = 4.0)

Fire Academy: Ratings – 5, 5, 4, 4, 4, 5, 5, 5, 5 (average = 4.67)

Comments:

• The Fire Academy provides very good career preparation. As soon as they have the time in service requirement completed they are able to qualify as a California Firefighter I.

• The Fire Science program can only improve in the future with the introduction of the California Officer I series. This was a major achievement by LTCC. The only reason the Fire Academy does not achieve a “5” in career preparation is the possibility in the future of placement or an active referral list of its graduates in a Paramedic Program and/or Fire Departments’ Cadet or intern programs.

• Scheduling the degree courses still seems to be a challenge; once they become more available it will make the program “5s” across the board.

• Overall, both programs provide a high quality candidate, however, the frequency of the fire science degree courses creates some limitations for those trying to finish a degree or develop knowledge to be more competitive during promotional processes.

5. **Is the college offering Fire Science courses (not Fire Academy) at the most convenient times and days for working professionals? (Most classes are held in the evenings, M-F or during the day on Fridays.)**

Yes (8)

No (0)

Unknown (1)

Comments:

• I had no trouble achieving my AA degree in an adequate amount of time.

• With the firefighter work schedule, this still appears to be the MOST convenient schedule.

• The schedule, when offered, is fine. The frequency is somewhat far apart.
6. The Fire Academy classes are currently scheduled Tuesday and Thursday evenings and all day on Saturdays. Effective fall quarter 2009, the classes will be offered all day on Saturdays and Mondays. Please rate your satisfaction with this schedule change on a scale of 1 (not supportive at all) to 5 (extremely supportive)

1: 0 ratings
2: 1 rating
3: 3 rating
4: 2 ratings
5: 2 rating

Unable to rate: 1 rating

Comments:

• I believe the new schedule will better support a student’s work and college schedule.

• A full day training at an Academy level allows time for a complete session if needed (e.g., live fire training, rope rescue class and drill). Multiple topics per day can still be utilized when an 8-hour session is not needed. This will also allow for easier weekly scheduling of other classes and work for the students. I believe this should benefit the instructors too.

• Could interfere with a 5-day work schedule having consecutive days off.

• If the District has difficulty with providing equipment during the new schedule, we will advise the committee so that changes can be made in the future.

• As long as the new schedule doesn’t hurt enrollment or instructor availability, it seems fine.

• I was unaware of a schedule change until receiving this survey. However, provided it meets the student demographic and is something the instructional staff can work with, I am fine with the change. Until I understand the previous issues, I am reluctant to comment or to rate the change.

7. LTCC is now a Regionally Accredited Training Program through the California State Fire Marshal’s Office. How does this accreditation affect your opinion of the Fire Science program or Fire Academy?

• The accreditation gives the programs validity and recognition, which is an asset to the graduate and the future employer.
• I know the accreditation process is difficult and I am pleased that the program was able to be accredited.

• It increases the academy’s draw of students inside the basin and from outside areas too. The accreditation provides uniform training and certification for students.

• This can only be a positive for the College and the community. I commend the Fire Science Program staff at LTCC in making this happen. It was a lot of work, and I thank you.

• Recognition of a program at a higher level seems like it would give better credibility to any program.

• It is great to know that our program meets or exceeds the standards of the state. It gives us more confidence in the students who graduate.

• Accreditation offers the ability to deliver additional training and also provides a measure of credibility to the programs, making them more attractive to candidates seeking this coursework. Credentialing is everything in today’s environment. It’s the only way the work product can be portable to those that are seeking a long-term career with the fire service.

8. **What is ONE suggestion you would like to make for improving the Fire Science program and Fire Academy at LTCC?**

• Provide a facility for them to train in that is located on the college grounds (i.e., a new training facility).

• Add more courses.

• Provide better facilities for training on campus.

• Continue to seek improvement in all areas. The program has come far since I attended LTCC.

• The changes to the Fire Programs at LTCC have been very dynamic over the past few years. I believe the Fire Programs at LTCC have moved at a pace that allows the flexibility in adapting to student demands and requirements, staff concerns, mandates and requirements established by the State of California College system, and a program that is based on vision and perseverance of LTCC in making this program the success it is today. I believe that staying the course for this program is appropriate at this time. With that said, I believe currently, the one improvement for the Fire Program is consistent with all the programs at LTCC: Student housing, convenient student
transportation to and from the college and town, college sponsored social activities, and programs that enhance the college lifestyle on campus and the Lake Tahoe area.

- Create a dedicated facility for public safety training.
- Fewer paperwork requirements would be nice.
- Keep the selection process as neutral and transparent as possible. We are changing the methodology for bringing reserves on board. Persons that are graduates of the LTCC academy will receive preference points in the process.

9. **Overall, how would you rate your level of satisfaction with the Fire Science program and Fire Academy at LTCC?** (1 = Not satisfied at all; 5 = Completely satisfied)

   **Fire Science**: (average = 4.56)
   
   1: 0 ratings  
   2: 0 ratings  
   3: 0 ratings  
   4: 4 ratings  
   5: 5 ratings

   **Fire Academy**: (average = 4.78)
   
   1: 0 ratings  
   2: 0 ratings  
   3: 0 ratings  
   4: 2 ratings  
   5: 7 ratings

10. **Other Comments?**

    - Provide more notice of your need for oral interviewing techniques evaluators. 60 days is needed in order to provide time for schedule planning of volunteers (Fire Academy).

    - Can the college work with the California State Fire Marshal's Office to offer National Fire Academy classes or other Emergency Management Institute or FEMA classes at LTCC? If the government is willing to pay to fly firefighters to Emmitsburg,
Maryland for training, why not offer the same courses at LTCC and enroll the students at the same time for LTCC for CEUs?

- Thank you for all your hard work to get this program going and to keep improving it.
- Sudden changes in program delivery could jeopardize the ability of the adjunct instructors to participate.
- Be openly cautious that changes to the Academy schedule do not compromise the ability of adjunct faculty to deliver the courses.

**K. STAFF DEVELOPMENT/PROFESSIONAL GROWTH**

The Fire Science program is currently instructed exclusively by adjunct faculty. Adjunct instructors have access to the following staff development opportunities:

- Instructional Skills Workshop (ISW).
- Advanced Teaching Workshop (ATW).
- Conference/Travel Funds (including North/Far North Regional Consortium travel funds for CTE faculty).
- Grant funding (such as SB-70 collaborative grant with Folsom Lake College or Regional Tech Prep collaborative grant with American River College) often supports professional development for Fire Science staff and adjunct instructors.
- The Instruction Office maintains a small budget to support adjunct faculty attendance at conferences/workshops which have direct bearing on their teaching.
- Staff Development Funds (adjunct faculty have the opportunity to apply for staff development funds).
- Access to teaching materials through the TLRC.
- Technical and instructor training provided through the California State Fire Marshal’s Office.
L. Final Recommendations

The Fire Science program at Lake Tahoe Community College has grown significantly since its inception in the 1970s. It is now the fourth largest instructional program at LTCC in terms of FTES production. The program is extremely technical in nature and complex in terms of its administration requirements. In 2008 the college received accreditation from the California State Fire Marshal as a Regional Training Program and this accreditation brings both prestige and additional workload issues related to student record keeping requirements and general Fire Academy administration.

The program review study has identified the following non-prioritized recommendations to further improve the quality and effectiveness of the Fire Science program at Lake Tahoe Community College:

1. Begin the assessment process for the Fire Science student learning outcomes (SLOs) in accordance with the college's procedures and deadlines.

2. Monitor the workload associated with the Fire Academy Coordinator position and increase weekly hours as feasible.

3. Monitor the Fire Academy schedule change to a Saturday/Monday format to assess availability of adjunct instructors and the ability of the fire agencies to support the Academy in terms of equipment, supplies, and facilities.

4. Continue to look for grant funding to support the acquisition of supplies, instructional equipment, and dedicated classroom space.

5. Ensure that California State Fire Marshal accreditation standards as a Regional Training Program are maintained.

6. Continue to recruit women and diverse students into the program.

7. Add Emergency Medical Technician (EMT) certification as a prerequisite to Fire Academy courses.