MISSION TRAILS REGIONAL OCCUPATIONAL PROGRAM

1. COURSE TITLE: Fire Science and Technology

2. CBEDS TITLE: Fire Fighting

3. CBEDS NUMBER: 5833

4. JOB TITLES: Fire Fighter

5. COURSE DESCRIPTION: This course provides students with an overview of skills necessary for entry-level employment in a fire science career. Student will lean basic firefighter theory and skills. Topics covered will include: fire science agency organization, regulations, and functions; firefighter safety; characteristics and behavior of fires; and fire prevention and control. Student will also learn fire equipment use, safety , and maintenance; hazardous materials response techniques; incident command principles; and search and rescue techniques.

6. HOURS:

Classroom	259
Community Classroom	150
Total hours	409

7. PREREQUISITES: Must be 16 years of age

8. REVISION DATE: January 12, 2004

9. COURSE OUTLINE:

a) CONTENT AREA SKILLS

i) **EXPECTED STUDENT OUTCOMES**

ii) **HOURS OF INSTRUCTION**

COURSE OUTLINE

CONTENT AREA SKILLS	**EXPECTED STUDENT OUTCOMES**	**HOURS** CL = Classroom CC = Comm. Class. CP = Co-op Ed.		
Instruction will include:	**Student will be able to:**	**CL**	**CC**	**CP**
1. **Fire Fighter Health and Physical Fitness** Physical training Health issues	1. Explain the need for physical fitness by fire fighter. 2. Describe the various factors which affect physical performance.	15	25	
2. **Physical Agility Testing** Able to pass Practices	1. Describe the different technique situations in a typical fire department physical agility assessment. 2. Describe techniques and abilities necessary to be successful in agility testing.	5	5	
3. **Fire Science Organization and Responsibility** Chain of Command Departments Station Life	1. Identify the basic component of the fire Prevention activities of a fire service. 2. Identify Fire Science Agency rules, Regulations and identify department policy on: • Uniform and dress • Conduct/misconduct • Shifts • Reporting time • Trading shifts • Station and equipment security • Substance abuse, including alcohol and tobacco • Discipline • Career Development 1. Demonstrate an understanding of the necessity for obedience and obligation to duty.	15	30	

	2. Describe the duties of typical fire service ranks and positions. 3. Describe the various functions and responsibilities of the fire service. 4. Identify resources to aid in the completion of its mission. 5. Identify the training and education available at in-service, regional, state and local fire service organizations and their related functions.			
4. **Combustion and Fire Behavior** Classes of Fire Heat energy & transfer Products of combustion Characteristics of fire	1. Describe the four classes of fire 2. Describe the four sources of heat energy 3. Describe the three methods of heat transfer 4. Describe the factors necessary for the combustion process to progress 5. Describe the products of combustion 6. Describe the three phases of fire 7. Compare and contrast the characteristics of pyrolisis, flash over, and backdraft. 8. Identify the protective measures to take when toxic combustion products are present. 9. Describe the various extinguishing agents and their capabilities. 10. Describe the various types of foams and their uses. 11. Identify the three methods of fire spread. 12. Describe how these methods can extend a fire horizontally, vertically and downward.	15	25	
5. **Protective Equipment and Safety** PPE SCBA PAD	1. Describe the relationship between personal protective equipment (PPE) and fire fighter safety; Wild land; Structural 2. Identify the limitations of personal protective clothing and equipment 3. Describe the effects of physical and mental stress and how the SCBA helps alleviate this stress. 4. Describe the four basic components of the SCBA apparatus and accessories. Demonstrate the proper donning of SCBA. 5. Describe the function and uses of the personal alarm device (PAD)	5	10	

	6. Identify the safety hazards within the fire fighting profession, accident prevention, and necessary procedures used to perform emergency functions in general, and at structure and vehicle fires.			
6. **Ropes, Knots, and Hitches** Usage in field	1. Identify the common ropes used in the fire services, comparing fibers, construction, and characteristics of each. 2. Identify the purpose and use of fire service knots 3. Demonstrate how to correctly tie fire service knots including: a. Knots to hoist equipment b. Knots to lower/raise safety ropes c. Knots to anchor safety ropes d. Knots to join rescue ropes 4. Demonstrate the proper procedures for loading a drop bag 5. Describe the basic requirement for proper storage of fire service ropes 6. Demonstrate the proper way of raising or lowering equipment safely 7. Observe the techniques of repelling	5	10	
7. **Hand tools: Use, Safety and Maintenance** Tools on the fire ground	1. Identify, explain, and demonstrate the safe and proper use of: a. Scraping tools b. Cutting tools c. Forcible entry tools d. Striking tools 2. Demonstrate the proper care and maintenance of above listed tools.	10	20	
8. **Fire Hose Operation, Nozzles, and Fittings** Types & sizes Care Loads & lays Appliances	1. Identify various fire hose sizes and types of construction 2. Identify and demonstrate methods of coupling and uncoupling hoses and nozzles. 3. Identify causes of fire hose destruction and the prevention steps required. 4. Identify how to care for and protect fire hose couplings 5. Identify the purpose and functions of all hose appliances. 6. Demonstrate how to reel and unreel fire Hoses	10	20	

	7. Identify and demonstrate various fire hose rolls using one or two persons 8. Explain the safety measures when rolling, carrying or dragging hoses. 9. Identify proper hose loads and uses 10. Describe the basic differences between the fog and straight stream nozzles and applications. 11. Identify the purpose and functions of special purpose nozzles. 12. Identify the purpose and functions of Master Stream appliances 13. Identify a hose ramp or bridge 14. Demonstrate the uses of chafing blocks			
9. **Ladders** Carry, raise & lower Work from ladder	1. Identify basic ladder safety practices 2. Identify various types of ladders 3. Describe ladder design, construction, testing and maintenance 4. Describe how to safely lift and lower ladders 5. Describe how to safely carry a ladder using various methods 6. Describe how to climb and work from a ladder	5	8	
10. **Search and Rescue** Remove victim from building	1. Describe the search and rescue procedures used in a burning, smoke-filled building 2. Describe the reasons why stairways are preferred over ladders for rescue methods 3. Demonstrate the various methods of handling a victim during a rescue a. Drags b. Assists c. Carries d. Lower/Raises	15	25	
11. **Fire Streams** Broken & Straight Chemical additives	1. Describe the methods of application of water streams for Class “A” fires 2. Describe foam agents used on Class “B” fires 3. Identify the safety precautions when handling a charge line 4. Identify the safety precautions involved with energized equipment 5. Demonstrate how to operate and advance	10	20	

12. **Fire Extinguishers** Usage of extinguishers Chemicals in extinguishers	1. Describe the characteristics and operation of the various classes of fire extinguishers 2. Describe the characteristics and operation of foam extinguishers 3. Describe the safety precautions when operating extinguishers 4. Identify the characteristics, operation and safety precautions for backpack extinguishers	10	20	
13. **Fire Protection Systems** Heat & smoke Detection Sprinkler systems	1. Describe the basic operating principles of various types of fire protection systems a. Identify the operating principles of various heat and smoke detectors b. Describe the operating principles of sprinkler systems and their components c. Describe the operating principles of standpipe systems 2. Identify the fire service support activities and safety measures to be observed when working with different types of fire protection systems.	5	10	
14. **Hazardous Materials** Hazmat safety Identification Containment Disposal Documentation	1. Describe a safety and competent Hazmat response 2. Describe the hazardous materials labeling system 3. identify the DOT and international placards 4. Describe the purpose of hazardous materials protective clothing, gear, and equipment 5. Describe the purpose and organization of the DOT Emergency Response Handbook 6. Describe the proper plans for containment of hazardous materials 7. Describe how to properly dispose and documentation of Decon 8. Describe the proper procedures in dealing with various agencies involved in hazardous material clean up 9. Describe pre-event and event planning	10	20	
15. **Fire Investigation, Cause and Origin** Assist in Scene preservation	1. Identify the fire investigation factors to observe en route to a fire 2. Identify the fire investigation factors to observe upon arrival at a fire	10	10	

	3. Identify the cause and origin factors to observe during a fire 4. Describe proper scene preservation			
		180	150	

COURSE OUTLINE

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
Instruction will include:	**Student will be able to:**	
1. **Personal Skills** ▪ Classroom policies & procedures ▪ Ethics → Work → Business ▪ Sexual harassment laws ▪ Personal skills, including positive attitude, self-confident, honesty, perseverance & self-discipline ▪ Professional appearance ▪ Time management ▪ Lifelong learning	**1. Understand how personal skill development, including positive attitude, honesty, self-confidence, time management, & other positive traits affect employability.** ▪ Demonstrate and understand classroom policies & procedures ▪ Define work and business ethics & demonstrate the importance of ethical standards & social responsibilities in the business environment. ▪ Discuss the laws applicable to sexual harassment & discuss tactics for handling harassment situations. ▪ Demonstrate personal skills in class and/or business environment: → Positive attitude → Self-confidence → Honesty → Perseverance → Self-discipline ▪ Demonstrate and model personal hygiene and acceptable professional attire ▪ Prioritize tasks and meet deadlines ▪ Explain the importance of lifelong learning	**Integrated in content area skills**
CAREER PERFORMANCE STANDARDS	**EXPECTED STUDENT OUTCOMES**	**HOURS**
Instruction will include:	**Student will be able to:**	

2. **Interpersonal Skills** ▪ Group dynamics ▪ Conflict resolution and negotiation ▪ Team work ▪ Etiquette across gender and cultural groups	2. **Understand principles of effective interpersonal skills, including group dynamics, conflict resolution, and negotiation.** ▪ Identify and explain the key concepts of group dynamics ▪ Discuss and demonstrate the dynamics of conflict resolution and negotiation, and their importance within the business environment ▪ Demonstrate effective teamwork, share responsibilities, accept supervision and assume leadership roles ▪ Demonstrate cooperative working relationships and proper etiquette across gender and cultural groups	**Integrated in content area skills**
3. **Thinking and Problem-Solving Skills** ▪ Critical and creative thinking skills ▪ Logical reasoning and problem-solving skills ▪ Numerical estimation, measurement, and calculation ▪ Identify, locate, and organize needed information and propose, evaluate, and select alternative solutions	3. **Understand the importance of critical thinking and problem-solving skills in the workplace**. ▪ Apply critical and creative thinking skills in a work environment and implement a plan of improvement as needed ▪ Demonstrate logical reasoning and problem solving skills in a work environment ▪ Apply numerical estimation, measurement and calculation skills to business applications including the following: → Whole number math → Decimals & fractions → Counting & monetary functions → Use of tables & graphs ▪ Recognize problem situations; identify, locate and organize needed information, and propose, evaluate and select from alternate solutions	**Integrated in content area skills**
CAREER PERFORMANCE STANDARDS	**EXPECTED STUDENT OUTCOMES**	**HOURS**

Instruction will include:	Student will be able to:	
4. **Communication Skills** ▪ Written communications ▪ Verbal and Nonverbal communications ▪ Active and effective listening ▪ Proper etiquette in business communications ▪ Writing and editing skills ▪ Use of reference material and handbooks ▪ Oral presentations	4. **Understand principles of effective communication.** ▪ Read and implement written instructions, technical manuals, written communication, and reference books ▪ Present a positive image of verbal and nonverbal communication through use of appropriate methods ▪ Demonstrate active and effective listening skills through verbal, nonverbal and written feedback ▪ Demonstrate proper etiquette in business communications, including an awareness of requisite for international communications (languages, customs, and time zones) ▪ Demonstrate the following writing and editing skills: → Use correct grammar, punctuation, capitalization, vocabulary and spelling → Write, proofread and edit → Select and use appropriate forms of communication ▪ Exhibit a proficiency in the use of reference materials such as dictionary, thesaurus, telephone directory, almanac, zip code directory, and office handbooks	**Integrated in content area skills**

5. **Occupational Safety** ▪ Good safety practices	5. **Understand occupational safety issues, including avoidance of physical hazards** ▪ Model and implement good safety practices including: → Avoidance and reporting of physical hazards in the work environment → Safe operation of equipment → Proper handling of hazardous materials	**Integrated in content area skills**
CAREER PERFORMANCE STANDARDS	**EXPECTED STUDENT OUTCOMES**	**HOURS**
Instruction will include:	**Student will be able to:**	

6. **Employment Literacy** ▪ Expand awareness of career opportunities ▪ Set employment goals and objectives ▪ Aptitudes, personal characteristics and interests ▪ Develop portfolio to C-TAP standards ▪ Develop interviewing techniques	**6. Understand career paths and strategies for obtaining employment.** ▪ Explore career opportunities and develop a career plan ▪ Identify steps for setting goals and writing personal goals and objectives ▪ Examine aptitudes related to career options; relate personal characteristics and interests to educational and occupational opportunities ▪ Develop a portfolio to include the following: → Letter of Introduction → Cover letter → Resume → Thank you letter → Job application → Licenses, Certificates and Awards → Transcripts → Letters of Recommendation → Work Samples	**Integrated in content area skills**
7. **Technology Literacy** ▪ Apply Industry specific technology ▪ Use Industry specific software ▪ Demonstrate Keyboarding ▪ Accessing information ▪ Lifelong enhancement of technology skills	7. **Understand and adapt to changing technology.** ▪ Identify and demonstrate use of appropriate technology ▪ Identify and use industry specific software ▪ Demonstrate proficiency in alphanumeric keyboarding ▪ Input and retrieve information ▪ Understand the importance of lifelong learning in adapting to changing technology	**Integrated in content area skills**

10. ADDITIONAL RECOMMENDED /OPTIONAL ITEMS

a. ARTICULATION:
This class is being submitted for Community College credit at Monterey Peninsula College

b. VOCATIONAL CREDIT:
30 units

c. ACADEMIC CREDIT: 10 high school credits per
This class may be used for academic credit as an elective for 10 units

d. INSTRUCTIONAL STRATEGIES: Demonstrations, Lab, Written assignments, Written tests and quizzes.
Lecture, demonstration, labs, applied practice, simulations, guest speakers, field trips

e. INSTRUCTIONAL MATERIALS: Student textbook:
IFSTA Essentials #4, International Fire Service Training Association book, Fire Protection Publications

California Department Forestry/Fire Protection 4300 manual

Firefighters Guide, National Wildfire coordinating group, US Forest Service

Department of Transportation (DOT) Hazardous Materials Guide, 2000

f. CERTIFICATES: Students will receive a Mission Trails ROP course certificate listing their job skill proficiencies.

Course completion certificate will be awarded upon satisfactory completion of course.