

STRANDS AND STANDARDS

FIRE SCIENCE, SAFETY AND SURVIVAL



Course Description

Principles of Fire and Emergency Services Safety and Survival, introduces students to the basic principles and history that relates to the 16 national firefighter life safety initiatives. This course focuses on the need for individual responsibility and commitment to safety throughout the fire and emergency services profession.

Intended Grade Level	11-12
Units of Credit	0.5
Core Code	40.06.00.00.015
Concurrent Enrollment Core Code	40.06.00.13.015
Prerequisite	None
Skill Certification Test Number	N/A
Test Weight	N/A
License Area of Concentration	CTE and/or Secondary
	Education 6-12
Required Endorsement(s)	
Endorsement 1	Fire Science
Endorsement 2	
Endorsement 3	

Strand 1

Students will understand the safety culture within the fire service and explore the need for cultural change.

Standard 1

Define the current fire safety culture.

Standard 2

Students will understand safety protocols and goals for firefighters within a fire department.

Standard 3

Examine some of the reasons people resist change to safety improvements in the fire service.

- Close-mindedness
- Loss of control
- Change not needed
- Tradition – it's always been done this way

Standard 4

Explore examples of other industries that have used leadership, management, and supervision to develop components of safety culture and how those examples can be used to improve safety within the fire service.

- Military
- Law Enforcement
- OSHA
- Mining

Performance Skills

Write a one-page research paper related to personal health and safety within emergency service careers.

Strand 2

Students will explore how personal accountability and organizational accountability contribute to improved health and safety.

Standard 1

Compare and contrast personal accountability and organizational accountability, highlighting their advantages.

Standard 2

Discuss ways that personal and organizational accountability can affect health and safety of individuals within fire and emergency services.

Standard 3

Explore the National Fire Protection Association Standard 1500 (Standard on Fire Department Occupational Safety, Health, and Wellness Program) and the process of using this standard to improve accountability related to the health and safety of individuals within an organization.

Performance Skills

Write a one-page paper on your views regarding the need to create health and safety parameters for organization accountability.

Strand 3

Students will define and learn how to apply risk management techniques.

Standard 1

Define risk management and explain why it is an important component of incident management.

Standard 2

Describe a risk-benefit analysis and its application to emergency services.

Standard 3

Examine the six steps of risk management.

- Define the context.
- Identify potential risk.
- Assess and analyze.
- Develop alternative plans.
- Deciding and implementing.
- Evaluating and monitoring.

Standard 4

Explain the four strategies to handle risk.

- Acceptance of the risk.
- Avoidance of the risk.
- Transfer of the risk.
- Mitigation of the risk.

Standard 5

Examine the five safety features of the incident management model.

- Safety Officer.
- Scene accountability (PAR).
- Emergency Traffic.
- Rapid Intervention.
- Responder Rehabilitation.

Standard 6

Explain the importance of risk management in the incident action plan (IAP), and identify risk management practices at the strategic, tactical, and task levels.

Performance Skills

Write a case study on the Occupational Safety and Health Administration's (OSHA's) "two-in, two-out" rule and its effect on rapid intervention.

Strand 4

Students will explore how empowerment leads to the elimination of unsafe acts.

Standard 1

Explain empowerment and how it relates to the fire safety culture.

Standard 2

Define what constitutes an unsafe act in the fire service.

Standard 3

Define the Law of Energy Conservation and explore how the transfer of energy causes injuries.

Standard 4

Explore of the four categories of unsafe acts and provide examples within each.

- Unsafe acts in the spotlight (visible).
- Unsafe acts in disguise (invisible).
- Poor risk management decisions.
- Distraction events.

Standard 5

Explore examples of using the following Initiatives to prevent injuries:

- Education (Initiative 14)
- Engineering (Initiative 8)
- Environment (Initiative 1)
- Enforcement (Initiatives 9 and 11)

Standard 6

Compare and contrast training fires and real fires and explain why it is important to understand them.

Standard 7

Explain the difference between “bolt-on” and “built-in” safety.

Standard 8

Describe crew resource management and the four components of human interaction necessary to institute it.

- Policies and Procedures.
- Situational Awareness.
- Communication.
- Problem Solving.

Performance Skills

Write a one-page paper or a discussion post on how you might address safety concerns with your supervisor.

Strand 5

Students will explore the standards for training, qualifications, and certifications (including regular recertification) that are equally applicable to all firefighters, based on the duties they are expected to perform.

Standard 1

Describe the purpose and advantages of credentialing for emergency responders.

Standard 2

Identify ways to use didactic learning skills and apply them to an effective psychomotor learning environment.

Standard 3

Explore the professional qualification standards regarding safety for the following:

- Firefighter I
- Firefighter II
- HazMat
- Apparatus Driver Operator (ADO)

- Technical rescue

Standard 4

Compare and contrast the differences in training requirements between volunteer firefighters and career firefighters.

Standard 5

Explore the Fire and Emergency Services Higher Education (FESHE) model and how it relates to career progression.

Standard 6

Explain the advantages of a tiered system of certification and how it could improve safety.

Performance Skills

Write a one-page paper or a discussion post on whether there is a need to adjust methods of training to the various risk scenarios that you may encounter.

Strand 6

Students will examine the medical and physical fitness standards that they can implement, and are equally applicable to all firefighters, based on the duties they are expected to perform.

Standard 1

Discuss what the national medical and physical fitness standards are as they are stated in NFPA 1500 and their relevance to fire and emergency responders.

Standard 2

Explain why improving the health, wellness, and fitness of emergency responders is important.

Standard 3

Explore the reasons heat dissipation is difficult for firefighters.

The environment is hot.

Personal Protective Equipment (PPE) makes sweat cooling difficult.

Personal Protective Equipment (PPE) makes it difficult to hydrate.

Standard 4

Define anaerobic and aerobic metabolism. Compare energy (ATP) creation from each type of metabolism.

Standard 5

Explain maximum heart rate and how emergency responses influences heart rate.

Standard 6

Examine the components of a firefighter's criterion test task.

- Hose dragging
- Stair climb
- Equipment carry
- Ladder raise and extension
- Forcible entry
- Search
- Rescue drag
- Ceiling pull

Standard 7

Describe the differences between wellness and “fit for duty”, and identify the NFPA standards developed for medical and fitness applications.

- Standard 1583 – Standard on Health-related Fitness Programs for Firefighters
- Standard 1582 – Standard on Comprehensive Occupational Medical Programs for Fire Departments

Performance Skills

Take a pre-assessment to determine your current level of physical fitness. Create goals to improve your fitness. Submit the results of your pre-assessment and an outline of your goals.

Strand 7

Students will explore how to utilize available technology to produce higher levels of member health and safety.

Standard 1

Describe how technology can produce higher levels of health and safety.

Standard 2

Describe some safety improvements that have evolved since the introduction of newer technologies in the fire service.

Standard 3

Explain the problems that can arise by overreliance on technology.

Standard 4

Discuss the use of technology in improving the medical monitoring of personnel.

Standard 5

Explain the theory of using time, distance, and shielding to prevent injuries.

Performance Skills

Submit a case study from a recent fire incident that could have been reduced or avoided with the use of available technology.

Strand 8

Students will explain the reasons for thoroughly investigating firefighter fatalities, injuries, and near-misses.

Standard 1

Examine the two reasons for thorough investigation.

- Find fault where fault exists.
- Identify the actions and contributing factors.

Standard 2

Define hindsight bias and explain how it affects events that have already occurred.

Standard 3

Explain the advantages of indemnity in the near-miss reporting process.

Standard 4

Explain why reporting is mandatory and explore the disadvantages of voluntary reporting as it applies to near-miss reporting.

Standard 5

Describe the process of near-miss reporting.

- Reporter information
- Event information
- Lessons learned
- Resources and weather

Standard 6

Examine the five leverage points that can be used when implementing a safety system.

- The Event
- Personal accountability (Initiative 2)
- Investigations and Near-misses (Initiative 9)
- Data Collection and Research (Initiative 7)
- Implementation (Initiatives 5 and 11)

Performance Skills

Visit the National Firefighter Near Miss Reporting System at the Firefighter Near Miss website. Click on the "Browse Reports" tab then answer the following:

"Is there is a need for such a reporting system when it comes to firefighter safety and does your own organization or an organization that you have contacted utilize it? Also, is there value in a national website with this information- why or why not?"

Strand 9

Students will explain the benefits of establishing response standards.

Standard 1

Explain the importance of understanding the terminology in policies and procedures.

Standard 2

Differentiate between standard operating procedures (SOP's) and standard operating guidelines (SOG's).

Standard 3

Examine the seven components of an effective procedure or guideline.

- Purpose
- Revision History
- Personnel Affected
- Policy
- Definitions
- Responsibilities
- Procedures

Standard 4

Discuss the assembling, modeling, and adoption of procedures.

Standard 5

Explain how safety would be improved with standard protocols and guidelines.

Performance Skills

Find a report on a firefighter fatality. Choose one of the causes of the firefighter fatal injuries listed in the report to be the basis of your research. Then use the internet as well as professional journals, articles, and other academically recognized sources (not including Wikipedia) to research and design an organizational policy based on an actual or realistic risk assessment and brief literature review that you perform for your current department or a future agency that you wish to serve. The intention of this policy is to minimize the potential injuries and death associated with the cause above.

Strand 10

Students will explore national protocols for response to violent incidents and explain why they should be continually developed.

Standard 1

Explain the differences between terrorism and other violent events such as riots.

Standard 2

Explain the importance of establishing better training to be prepared for violent incidents.

Standard 3

Examine the specific types of violent incidents and how common protocols can be used to save lives, increase communications between agencies, and create quick responses.

- Civil disturbances
- School or public shooting
- Bomb threats and possible bombs
- Illegal drug and explosive labs
- Medical and mental health emergencies
- Animal attacks

Standard 4

Explain the reasons that fire and emergency services (EMS) uniforms should be professional yet unique.

Standard 5

Define Level II staging and explain the benefits of using Level II staging for violent events.

Performance Skills

Submit a case study identifying a situation in which “staging for a safe scene” is not an option. If this is the case, describe how to best prepare for this incident.

Strand 11

Students will explain the need for firefighters and their families to have access to counseling and psychological support.

Standard 1

Compare the effects of physical and psychological stresses of a critical incident on the health and well-being of

responders.

Standard 2

Explain why relying on alcohol or drugs is an unhealthy coping mechanism.

Standard 3

Describe healthy ways to deal with stress.

Standard 4

Compare and contrast critical incident stress and post-traumatic stress disorder.

Standard 5

Explain the differences between demobilizing, defusing, and debriefing in critical incident stress management (CISM).

Performance Skills

Write a one-page paper on the need for counseling and psychological support for emergency services personnel and their families. Include local resources and services and how to contact them.

Strand 12

Students will understand and advocate for the need for increased public education for critical fire and life safety programs.

Standard 1

Identify effective ways to educate the general public about critical fire and safety programs.

Standard 2

Understand the difference between prevention and preparation.

Standard 3

Describe available resources for educating the general public in relation to fire and safety.

Standard 4

Explain the purpose of using an action plan to ensure safety during equipment demonstrations.

Standard 5

Describe the link between fire and life safety education and firefighter safety.

Performance Skills

Prepare and deliver a five-minute fire or life safety demonstration in accordance with NFPA Standard 1001, 5.5.2.

Strand 13

Students will examine various fire/building codes, including the installation of residential sprinkler systems.

Standard 1

Explain how fire/building codes are adopted.

Standard 2

Discuss some of the arguments for and against residential sprinkler systems.

Standard 3

Describe how fire/building codes directly affect occupant and firefighter safety.

Performance Skills

Read the “Elk Ridge, UT Code of Ordinances, section 10-12-38: Fire Sprinkling Systems Requirements.” Write a one-page paper explaining when sprinkler systems are required in this jurisdiction and what national standards are referenced for installation.

Strand 14

Students will understand why safety must be of primary concern in the design of apparatus and equipment.

Standard 1

Discuss why safety should be a primary consideration in the design of apparatus and equipment.

Standard 2

List some of the groups responsible for originating safety.

- National Fire Protection Association (NFPA)
- National Institute for Occupational Health and Safety (NIOSH)
- Occupational Safety and Health Administration (OSHA)

Standard 3

Compare the level of safety of a piece of equipment when safety is designed into versus retrofitted.

Standard 4

Explain how a cost-benefit analysis can justify investing in safety techniques.

Performance Skills

Locate the USFA Emergency Vehicle Safety Initiative study. Read the study and its contained documents. Write in detail the following:

- What prompted the creation of the Emergency Vehicle Safety Initiatives?
- How might a fire department use the Emergency Vehicle Initiatives?

Workplace Skills

- Communication
- Problem Solving
- Teamwork
- Critical Thinking
- Dependability
- Accountability
- Legal Requirements/expectations