

# Introduction to Fire Science

## Course Design

2005-2006

### **Course Information**

<b>Organization</b>	Eastern Arizona College
<b>Division</b>	Science and Allied Health
<b>Course Number</b>	FSC 100
<b>Title</b>	Introduction to Fire Science
<b>Credits</b>	3
<b>Developed by</b>	B. Stephen Cullen, Ph.D. & Harry Swanson
<b>Lecture/Lab Ratio</b>	Lecture=3; Lab=0
<b>Transfer Status</b>	Non Transfer
<b>Activity Course</b>	No
<b>CIP Code</b>	43.0203
<b>Assessment Mode</b>	Pre/post Test Questions=100; Points=100
<b>Semester Taught</b>	Upon Request
<b>GE Category</b>	None
<b>Separate Lab</b>	No
<b>Awareness Course</b>	No
<b>Intensive Writing Course</b>	No

### **Prerequisites**

None

### **Educational Value**

This course is designed for those who aspire to enter the profession of fire fighting.

### **Description**

The primary intent of this course is to acquaint new firefighters with history, traditions, terminology, organization and operation of the service.

### **Textbooks**

Jebb Fortney, Project Manager/Editor and Lynne Murnane, Senior Editor: Oklahoma State University;. *Fire Service Orientation and Terminology*. Edition: 4th. Publisher: Fire Protection Publication. Year: 2004. Required

## **Supplies**

Access to Computer

Access to Internet

Notebook

## **Competencies and Performance Standards**

### **1. Discuss and describe the scope, purpose and organizational structure of fire and emergency service.**

#### **Performance Standards**

*Student will demonstrate competence by*

- o identifying the different types of fire service positions.
- o understanding the recruitment, application, and selection process.
- o describing the major organizations that provide emergency responses.
- o understanding the primary mission of the fire service.
- o identifying the six objectives of successful fire fighting.
- o defining roles of responsibility for the major roles of fire suppression.

*Student performance will be successful when he/she*

- o lists and defines the four basic types of fire service positions including, career, volunteer, combination, paid-one-call, and public safety departments.
- o outlines in writing the firefighter selection process including recruitment, application, written examination, physical ability test and oral interviews.
- o recites the primary mission of the fire service.
- o list and defines the six objectives of successful fire fighting including rescue, exposure protection, fire confinement, fire extinguishment, salvage and overhaul, and fire cause determination.
- o lists and outlines in writing the eight major personnel positions of fire suppression personnel including firefighter, fire apparatus driver/operator, company officer, battalion or district chief, safety officer, public information officer, assistant or deputy chief, and fire chief. Student will also draw an organization chart to support response.

### **2. Identify and explain the components of fire prevention including code enforcement, public information, and public and private fire protection systems.**

#### **Performance Standards**

*Student will demonstrate competence by(colon out)*

- o reciting an overview of early traditions of the history of fire protection in America.
- o recognizing and listing the common fire hazards.
- o recognizing and reciting the steps of fire survey.
- o identifying the standard map symbols.
- o identifying the basic steps included in the process of fire investigation.

*Student performance will be successful when he/she*

- o outlines in writing the evolution of fire service, including early fire laws and ordinances.
- o outlines in writing the evolution and development of the fire engine, gear and equipment.
- o lists in writing the major fires that had a significant impact of the development of fire service.
- o lists in writing common and special fire hazards. Student will also list in writing with 100% accuracy target hazard properties.
- o outlines in writing the basic steps with 100% accuracy for a fire survey including the qualifications needed for personnel to conduct survey.
- o with 100% accuracy, completes written exam pertaining to standard map symbols.
- o draws a map of a predetermined structure with 100% accuracy using standard map symbols.
- o list and defines in writing the role of the fire investigation.

**3. Analyze the basic components of fire as a chemical reaction, the major phases of fire, and examine the main factors that influence fire spread and fire behavior.**

***Performance Standards***

*Student will demonstrate competence by(colon out)*

- o gaining understanding of the basic concepts of physical science and defines fire.
- o defining the terms fire, transmission of heat, conduction, convection, radiation, matter, conservation of mass and energy, and chemical reactions .
- o defining combustion and outlining the four components necessary for combustion to occur.
- o identifying common oxidizers.
- o defining fire development and the three stages of fire development.

*Student performance will be successful when he/she (colon out)*

- o defines in writing the terms fire. Defines in writing the term Physical Science
- o lists and defines with 100% accuracy the following terms: transmission of heat, conduction, convection, radiation, matter, conservation of mass and energy, and chemical reactions.
- o lists and defines in writing with 100% accuracy the four components necessary for combustion to occur, including (colon out) oxygen, fuel, heat, and self-sustained chemical reaction.
- o lists in writing the common oxidizers, including ( colon out) Bromates, Bromine, Chlorates, Chlorine, Fluorine, Iodine, Nitrates, Nitric acid, Nitrites, Perchlorates, Permanganates, and Peroxides.
- o lists in writing and defines with 100% accuracy the stages of fire development, including ignition, growth, flashover, fully developed, and decay.

**4. Describe the common types of fire and emergency service facilities, equipment, and apparatus.**

***Performance Standards***

*Student will demonstrate competence by(colon out)*

- o identifying the basic types of building construction.
- o gaining understanding of firefighter hazards related to building construction.
- o identifying the major types of alarm systems.
- o describing the importance of automatic sprinkler systems and how they function.
- o identifying the major facilities of a fire department.
- o identifying the basic equipment that pumpers carry.
- o identifying the four distinct categories of aerial apparatus.
- o identifying the three types of rescue vehicles.
- o identifying special firefighting units.

*Student performance will be successful when he/she(colon out)*

- o lists and defines with 100% accuracy the five types of building construction.
- o lists and defines basic hazards as applied to building condition and construction.
- o lists and defines with 100% accuracy the major types of alarm systems including heat, fixed-temperature heat, rate-of-rise heat, photoelectric smoke, ionization smoke, automatic, remote, proprietary, and central station systems.
- o outlines in writing the importance of automatic sprinkler systems and diagrams and how they function.
- o lists and defines in writing the fire department facilities including fire stations, administrative offices, telecommunication centers, training centers, and maintenance shops.
- o lists in writing the basic equipment that pumpers carry including ladders, forcible entry tools, nozzles, hose adapters/appliances, hose tools, self-contained breathing apparatus, pike poles, and salvage covers.
- o lists in writing the four distinct categories of aerial apparatus including aerial ladder, platform, telescoping platform apparatus, and articulating aerial platform apparatus.
- o lists and defines light medium, and heavy rescue vehicles and gives example of each.
- o recites example of special firefighting units including mobile, air and fireboat.

## **5. Compare and contrast effective management concepts for various emergency situations.**

### ***Performance Standards***

*Student will demonstrate competence by*

- o understanding the four basic organizational principles as applied to fire fighting.
- o understanding the importance and function of organizational chart.
- o recognizing the different types of fire departments.
- o understanding how fire departments are funded.
- o comparing and contrasting the difference between policies and procedures.
- o identifying the basis for clear communication and effective operations.
- o recognizing the five major areas of the Incident Management System.

*Student performance will be successful when he/she*

- o lists the four basic organizational principles that firefighters must remember including

- o unity of command, span of control, division of labor, and discipline.
- o defines in writing the term organizational chart and purpose.
- o draws organizational chart for small-sized, medium-sized, and large-sized fire departments.
- o lists in writing the basic types of fire departments including municipal, public safety, county/parish/borough, fire district, and fire protection district.
- o outlines the funding sources for different types of fire departments.
- o compares and contrasts the concepts of policies and procedures.
- o lists in writing the basis for clear communication including common terminology, modular organization, integrated communications, unified command structure, consolidated action plan, manageable span of control, and comprehensive resource management.
- o draws an organization chart that reflects the major areas the Incident Management System.

## ***Grading Information***

### ***Grading Scale***

A	100-90%
B	89-80%
C	79-70%
D	69-60%
F	Below 60%