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## Course Outline for FST 74A

### FIRE INVESTIGATION 1A

Effective: Fall 2006

#### I. CATALOG DESCRIPTION:

FST 74A — FIRE INVESTIGATION 1A — 2.00 units

An introduction into the principles of fire investigation including fire investigation techniques relating to different types of fires. Recognition of arson laws and penalties in California, laws related to scene preservation and evidence collection. Fire origin and cause determination within the fire ground environment. Fire scene documentation requirements. This is a State of California Fire Marshal, CFSTES (California Fire Service Training and Education System) course approved by the California State Fire Board of Fire Services. A certificate will be issued by the California State Fire Marshal, State Fire Training upon successful completion of the course.

2.00 Units Lecture

#### Grading Methods:

Letter Grade

#### Discipline:

	<b>MIN</b>
<b>Lecture Hours:</b>	36.00
<b>Total Hours:</b>	36.00

#### II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

#### III. PREREQUISITE AND/OR ADVISORY SKILLS:

#### IV. MEASURABLE OBJECTIVES:

**Upon completion of this course, the student should be able to:**

- A. Identify the factors affecting the national arson problem;
- B. Define fire and understand basic behaviors of fire;
  1. Identify the elements necessary for self-sustained, open flaming combustion.
  2. Explain each of the four methods of heat transfer.
  3. Identify each of the three phases of fire.
  4. Identify and define each of the four classifications of fire.
  5. Explain how flashover and /or backdraft may affect the evaluation of a fire scene.
- C. Identify and explain local ordinances which establish authority to investigate fire origin and cause;
- D. Explain the current court decisions applying to the authority to hold, search, and protect a fire scene;
- E. Identify and explain when and what types of legally authorized searches a fire investigator may institute;
- F. Explain courtroom testimony and proper demeanor;
- G. Understand the basics of documenting a fire scene;
- H. Identify the relevant information within the scene and preserve it by sketching graphics;
  - I. Explain the relationship between point of origin and fire cause;
- J. Define the term "overhaul" and explain why overhaul must sometimes be delayed;
- K. List indicators and techniques used by the investigator to identify point of origin;
  1. Identify and explain "V" patterns.
  2. Explain "depth of char" indicators.
- L. Explain the importance of scene reconstruction;
- M. Explain the elements required for a fire cause;
- N. List common accidental fire causes and identify indicators which help identify accidental fires;
- O. Explain elements for an electrically caused fire;
  1. List common electrical fire causes.
  2. Identify electrical fire indicators.
- P. Identify and recognize those unusual situations which help identify incendiary fires;
- Q. Identify indicators which suggest the presence of a flammable liquid;
- R. Identify incendiary devices;
  1. Identify and explain the effects of incendiary devices.
  2. Explain how incendiary devices ignite.
- S. Identify investigation procedures;
- T. Identify safety precautions and equipment;
- U. Identify how to properly secure the building;
- V. Identify the basic information the investigator should obtain from a witness during an interview;
- W. Identify procedures used to investigate vehicle fires;
  1. Identify safety concerns while investigating vehicle fires.

- X. Identify procedures used to investigate wildland fires;
  - 1. Identify accidental causes of wildland fires.
  - 2. Understand relative humidity and fuel moisture for ignition potential in dry grass.
  - 3. Recognize and identify the wildland, fireground environment.
  - 4. Identify common incendiary devices used in the wildland arson fire.
- Y. Identify types of explosions;
  - 1. Identify three effects of an explosion
  - 2. Identify assisting agencies for investigation related to explosions
  - 3. Explain scene safety requirements and secondary devices

#### V. CONTENT:

- A. Introduction
  - 1. Orientation and administration, CFSTES, State Fire Marshal
  - 2. Certification track
- B. Principles of Fire Investigation
  - 1. Local and national arson problems
  - 2. Motives of fire setters
  - 3. Fire investigation responsibilities
  - 4. Types of investigators
- C. Review of Fire Behavior and the Chemistry of Fire
- D. Legal Aspects of Fire Investigation
  - 1. Constitutional law and the Fire Investigator
  - 2. Search and seizure laws
  - 3. "Curriculum vitae", the expert witness
  - 4. Courtroom testimony and investigator demeanor
- E. Arson Laws in California
  - 1. Identify all arson laws within the penal code of California
  - 2. Explain all penalties associated with arson laws in California
  - 3. Define enhancement penalties
- F. Fire Scene Documentation
  - 1. Fire scene report narrative
  - 2. Witnesses statements
  - 3. Evidence collection
  - 4. Photography
  - 5. Diagram – scene sketching
- G. Point of Origin Determination
  - 1. Origin vs. fire cause
  - 2. "Overhaul" defined
  - 3. Scene examination procedures
  - 4. Burn patterns – indicators of fire behavior and growth
- H. Accidental Ignition Sources
  - I. Electrical Ignition Sources
    - 1. Basic electrical equipment and systems
- J. Arson Fire Indicators
- K. Incendiary Devices
- L. Structure Fire Investigation
- M. Vehicle Fire Investigation
- N. Wildland Fire Investigation
- O. Explosions

#### VI. METHODS OF INSTRUCTION:

- A. Classroom discussion
- B. Slide projection
- C. Video presentations
- D. **Lecture** -
- E. Lab demonstration
- F. **Field Trips** -
- G. Power Point presentations

#### VII. TYPICAL ASSIGNMENTS:

A. Reading assignments should be given with each section covered utilizing the courses primary text(s). This can include reading assignments or review of various handout materials. B. Homework should be assigned with each section covered. The number of problems assigned will vary, but should include both identification and comprehension of reading assignments and sections covered in the classroom environment. For example a typical homework assignment could include 5-10 definitions and also the correlations between the definitions in their applications upon investigative discovery of evidence or as fire indicators as it applies to fire behavior within a fire scene environment. C. Lab assignments could include the designing of different incendiary devices and or time delay ignition devices. This could include the testing of these devices to identify the affects upon the cause of a fire and to identify the evidentiary remains. D. Term project could include the students creating a "plot-plan" of their personal residence to scale. This would also include the students identifying a room of choice (example: Bedroom, Family Room, Living Room) and drawing a detail, to scale, sketch of the room and its contents. This would include the provision of a photographic evidence log with photographs, and measurements of all area findings to be included. This would develop the skills necessary for fire scene documentation.

#### VIII. EVALUATION:

##### A. **Methods**

- 1. Exams/Tests
- 2. Quizzes
- 3. Projects
- 4. Home Work
- 5. Lab Activities
- 6. Other:
  - a. Methods of Evaluation
    - 1. Announced quizzes
    - 2. Midterm exam
    - 3. Lab assignment
    - 4. Homework

5. Term project
6. Final exam (State CFSTES Exam-50 multiple choice) minimum passing score 70% for Certification

## B. Frequency

1. Frequency of Evaluation
  - a. Recommend minimum eight quizzes and one final exam (Instructors have the option to utilize developed quizzes provided by the State Fire Marshal CFSTES course curriculum for Fire Investigation 1A).
  - b. Recommend homework from each section covered in class.
  - c. Types of Quiz and Midterm Questions
    1. List the five burn indicators that may substantiate the fire was incendiary.
    2. Definitions of arson law are found in what section of the Penal Code?
    3. What are the three components necessary to exist, according to the definition of a fire bomb?
  - d. Final Exam
    1. The Final Exam is prepared and provided by the State Fire Marshal.
    2. The final exam is a state mandated 50 multiple choice question exam.
    3. Minimum passing score is 70% or 35 correct out of 50.

## IX. TYPICAL TEXTS:

1. California Department of Forestry and Fire Protection-State Fire Training *Fire Investigation 1A*", *Student Manual.*, CFSTES, 1996.
2. - *Introduction to Fire Origin and Cause*. 3rd ed., IFSTA, 0.
3. - *Fire Investigator*. 1st ed., IFSTA, 0.

## X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. 3 Ring minimum 11/2 inch binder for student manual
- B. Ruler (12 inch)
- C. Measuring tape (15 feet)
- D. Camera