

**FIRE 61 Course Outline as of Fall 2011****CATALOG INFORMATION**

Dept and Nbr: FIRE 61 Title: FIRE INVESTIGATION

Full Title: Fire Investigation

Last Reviewed: 9/25/2017

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	17.5	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

Determining cause of fires (structure, vehicle and wildland) and their behavior as it relates to fire investigation; introduction to arson, incendiary, fatal fires and explosions; related laws; recognizing and preserving evidence; interviewing witnesses and suspects; arrest and detention procedures; court procedures and giving court testimony. A fire investigation conducted in the field is required as part of the course. Upon successful completion of the course, the student will be awarded a Fire Investigation 1A certificate from the State Fire Marshal's office.

**Prerequisites/Corequisites:****Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100

**Limits on Enrollment:****Schedule of Classes Information:**

Description: Determining cause of fires (structure, vehicle and wildland) and their behavior as it relates to fire investigation; introduction to arson, incendiary, fatal fires and explosions; related laws; recognizing and preserving evidence; interviewing witnesses and suspects; arrest and

detention procedures; court procedures and giving court testimony. A fire investigation conducted in the field is required as part of the course. Upon successful completion of the course, the student will be awarded a Fire Investigation 1A certificate from the State Fire Marshal's office. (Grade Only)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective: Fall 1981	Inactive:
<b>UC Transfer:</b>		Effective:	Inactive:

**CID:**

**Certificate/Major Applicable:**

Certificate Applicable Course

## **COURSE CONTENT**

### **Outcomes and Objectives:**

1. Identify the laws applicable to fire investigation.
2. Demonstrate an understanding of fire behavior as it relates to fire investigation.
3. Describe the methodologies used to investigate structure fires.
4. Describe the common indicators found at fire scenes.
5. Identify the common causes of accidental fires.
6. Identify the indicators unique to arson fires.
7. Describe the conditions that lead to electrically caused fires.
8. Describe the methodology used to investigate vehicle fires.
9. Describe the additional steps and considerations taken in fatal fire investigations.
10. Identify the components of a comprehensive investigation report.
11. Describe the different types of explosions and their impact on fire investigation.
12. Describe the methodology used to investigate wildland fires.

### **Topics and Scope:**

- I. Introduction to Fire Investigation
  - A. Terminology
  - B. Arson trends and statistics
- II. Legal Aspects of Fire Investigation
  - A. Constitutional law
  - B. Arson laws
  - C. Search and seizure

1. Reasonable times to search
  2. Consent
  3. Plain view
  - D. Courtroom testimony
  - E. Case law
    1. Michigan vs. Tyler
    2. Michigan vs. Clifford
- III. Fire Behavior
- A. Combustion
  - B. Pyrolysis
  - C. Fire chemistry
  - D. Heat transfer
  - E. Phases of fire
  - F. Effects of accelerants
- IV. Investigation Methodology
- A. National Fire Protection Association Standard (NFPA) 921
  - B. The scientific method of investigation
- V. Fire Scene Examination
- A. Fire scene indicators
  - B. Accidental fire causes
  - C. Arson fires
    1. Motive
    2. Indicators
    3. Accelerants
      - a. Types
      - b. Characteristics
    4. Structural damage/irregularities
    5. Fire location and damage
    6. Incendiary devices
  - D. Fire effects
  - E. Fire movement and pattern analysis
  - F. Recognizing fire indicators
  - G. Tracking the fire course
  - H. Point of origin determination
- VI. Electrical Fire Investigations
- A. Types of current
  - B. Electrical calculations and formulas
    1. Wiring systems
    2. Over current protection devices
  - C. Ignition by electrical means
  - D. Testing of electronic devices
- VII. Vehicle Fire Investigations
- A. Accidental vehicle fires
  - B. Vehicle fire prevention devices
  - C. Vehicle arson fires
  - D. Vehicle fire scene examination
- VIII. Fire Fatality Investigation
- A. Identification and preservation of the body
  - B. Effects of fire on bodies
  - C. Coordination with the coroner and law enforcement
- IX. Documenting Fire Scenes
- A. Report narrative

- B. Witness statements
- C. Evidence
- D. Photographs
- E. Diagrams
- X. Explosions and Explosive Combustion
  - A. Terminology
  - B. Types of explosions
    - 1. Mechanical explosions
    - 2. Chemical explosions
    - 3. Diffuse vapor explosions
  - C. Explosive types
    - 1. Low explosives
    - 2. High explosives
    - 3. High and low order
  - D. Investigation of explosions
- XI. Wildland Fire Investigation
  - A. Fire causes
  - B. Fire behavior
  - C. Fire scene examination
    - 1. Indicators
    - 2. Incendiary devices
    - 3. Evidence collection

### Assignment:

1. Reading 20-30 pages weekly from textbook and state-supplied student supplement
2. Research paper (Minimum 500 words)
3. Fire analysis paper (Minimum 500 words)
4. Fire dynamics group presentation
5. Fire investigation report
6. One site investigation/field trip
7. Four to six quizzes, a midterm and a state exam

### Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Fire analysis paper, research paper and fire investigation report
---

Writing 40 - 50%
---------------------

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Fire analysis paper
---------------------

Problem solving 20 - 30%
-----------------------------

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Field investigations, group presentation	Skill Demonstrations 10 - 20%
<b>Exams:</b> All forms of formal testing, other than skill performance exams.	
Quizzes, multiple choice midterm, and state exam	Exams 20 - 30%
<b>Other:</b> Includes any assessment tools that do not logically fit into the above categories.	
None	Other Category 0 - 0%

**Representative Textbooks and Materials:**

Kirks Fire Investigation, 6th Ed.; by John D. DeHaan, Publ. Prentice Hall, 2007  
 CFSTES Manual Fire Investigation 1A, California Fire Service Training and Education System, Sacramento, CA 2003