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| Name: | <i>Incendiary Fire Analysis and Investigation</i> |
| Course Description: | This course examines technical, investigative, legal, and managerial approaches to the arson problem, including principles of incendiary fire analysis and detection, environmental and psychological factors of arson, gang-related arson, legal considerations and trial preparations, managing the fire investigation unit, intervention and mitigation strategies, and shaping the future. |
| Objectives: | <p>Unit 1: Introduction to Incendiary Fire Analysis and Investigation</p> <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • cite the national fire data trends on property and loss of life in the United States as a result of incendiary and suspicious fire; • explain the difference among the terms "arson," "incendiary" and "suspicious" relative to the NFPA classification of fire incidents; • indicate the importance of NFPA's operational definitions for the terms "incendiary" and "suspicious" fires; • distinguish between the NFIRS and NFPA fire data collection systems; • identify the significance of these systems for the analysis of incendiary fire trends; • identify four of the major organizations with resources available to assist communities as they develop fire analysis procedures; and • identify the main elements of an effective incendiary fire prevention program. <p>Unit 2: Chemistry of Fire</p> <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • identify the four elements of the fire tetrahedron; • describe the interrelationships of these four elements; • describe the burning characteristics of solid, liquid, and gaseous fuels; • define pyrolysis; • define heat release rate; • name five different ignition sources; and • describe the relationship between types of fuel and possible ignition sources. <p>Unit 3: Fire Dynamics</p> <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • describe the three methods of heat transfer; • describe the ignition process in solid fuels; • describe the effects of heat release rate on types of fuel; • explain the importance of the plume in the development of compartment fires; • describe the interrelationship of fuel, heat release, ventilation, and time; • define the critical factors in flashover and extension; and • describe the effects of fire on materials such as glass, wood, concrete, and metals. |

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| Objectives: | Unit 4: Fire Scene Investigation |
| | <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • define the roles of first responders in cause and origin determination; • describe the necessity of preserving the fire scene while implementing appropriate suppression tactics; • describe the sequence of activities in proper scene documentation; • list the sequence of basic steps in fire investigation; • describe the importance of matching ignition sources to the fuel first ignited; • describe special considerations of: <ul style="list-style-type: none"> - wildland fires; - vehicle fires, and - highrise fires; • describe the impact of Supreme Court decisions in <i>Michigan v. Tyler</i> and <i>Michigan v. Clifford</i>; and • list advantages and disadvantages of canine arson accelerant detection teams. |
| | Unit 5: Incendiary Crime Investigation |
| | <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • identify the five major steps in a comprehensive incendiary crime investigation; • identify six persons who should be interviewed during the investigation; • list five sources of ownership/occupant and other case-specific information; and • describe three legal requirements of the investigative process. |
| | Unit 6: Environmental Factors Influencing the Arson Problem |
| | <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • list nine general motives for arson behavior; • describe the economic conditions that help to identify an arson-prone neighborhood; • describe the "vacant lot" arson scheme; • identify susceptible properties for "building improvement" arson; • describe the two forms of arson that occur during civil unrest; • explain the effects of insurance plans and property transfers in identifying potential arson targets; and • list the political and social factors that influence arson target selection. |
| | Unit 7: The Sociology of Arson: Criminal Gangs and Gang-Related Arson |
| | <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • describe changing value systems and their effect on the arson problem; • explain how local gangs are involved in arson; • list the various factors that illustrate the role of international organized crime on arson; and • identify connections between the drug culture and arson. |

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| Objectives: | Unit 8: Psychological Factors Influencing the Arson Problem |
| | <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • list and describe the three major categories of juvenile firesetters; • cite each of the six diagnostic criteria for pyromania as stated in the <i>Diagnostic and Statistical Manual of Mental Disorders</i>, 4th Ed. (DSM-IV); • describe the characteristics of vanity firesetters; • provide examples of each of the three types of revenge firesetters; • discuss the connection between arson and other types of crimes; and • explain the criminal profiling process and describe the profile of a professional arsonist. |
| | Unit 9: Legal Considerations and Preparing for Trial |
| | <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • differentiate between a civil and a criminal act; • list the four elements of common-law arson; • describe the Exclusionary Rule and its effect on the arson investigator; • summarize the provisions of the Fourth Amendment; • define the terms arrest and detention; • state the constitutional limits involving the privilege against self incrimination and the right to counsel in the contexts of an arrest, interrogation, and confession; • trace the major steps of the criminal trial process from arrest through adjudication; • define and give examples of relevant evidence; • recognize a statement that is hearsay; • explain the Best Evidence Rule as it pertains to written instruments; and • describe the role of an arson investigator as an expert witness when testifying in court. |
| | Unit 10: Managing the Fire Investigation Unit |
| | <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • describe the functional organization of a fire investigation unit; • choose from several proactive arson prevention strategies; • identify quality management principles; • develop quality management plans; • identify effective case management procedures; • recognize performance measurement factors for fire investigation units; • develop a performance-based budget; and • recognize essential training, standards, and accreditation practices. |
| | Unit 11: Intervention and Mitigation Strategies for Combating Arson |
| | <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • discuss the role of the community in arson reduction efforts; • describe the role of local public safety organizations in developing incendiary mitigation programs; • discuss the role of the private sector in arson mitigation; • define the use of pattern recognition and other profiling techniques in identifying arson-prone targets; and • list sources of data available at the local, state, and federal levels in planning anti-arson strategies. |

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| Objectives: | Unit 12: Shaping the Future of Arson Investigation |
| | <p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • identify and describe the possible future processes and techniques involved in fire investigation; • describe the educational needs and technical competence of the fire investigator in the future; • explain the difference between probabilistic and deterministic fire models; • identify and describe the differences between zone and field models of compartment fires; • identify the importance of fire model validation procedures for the fire investigator; • describe the possible application of various fire models in the fire investigation process; and • explain the possible advantages of the application of expert system models to fire investigation management. |
| Required Texts: | <p><i>Kirk's Fire Investigation</i>; Brady/Prentice Hall, Inc. <i>NFPA 921, Guide for Fire and Explosion Investigations</i>; NFPA. <i>Incendiary Fire Analysis and Investigation Course Guide</i>, National Fire Academy <i>U. S. Arson Trends and Patterns</i>, NFPA <i>InterFire Virtual Reality CD-ROM</i>, U. S. Fire Administration</p> |
| Supporting References/ Research for Faculty and Students | <p>U. S. Fire Administration <u>Publications</u> : http://www.usfa.fema.gov/applications/publications/pubs_main.cfm See Fire Protection, Fire Administration, Fire Service Operations, Wildfire <u>Applied Research</u>: http://www.usfa.fema.gov/dhtml/inside-usfa/research.cfm <u>Research Reports</u>: http://www.usfa.fema.gov/dhtml/inside-usfa/r_reports.cfm <u>Technical Reports</u>: http://www.usfa.fema.gov/applications/publications/techreps.cfm <u>Topical Fire Research Series</u>: http://www.usfa.fema.gov/dhtml/inside-usfa/tfrs.cfm Learning Resource Center: http://www.usfa.fema.gov/dhtml/inside-usfa/lrc.cfm National Institute for Standards and Technology http://www.fire.nist.gov: Fire Tests/Data, Software/Models, Publications, FIREDOC (under Publications) Current Events/News http://www.firehouse.com/ http://www.fireengineering.com/ http://www.withthecommand.com/</p> |

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| Assessment: | Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor. | |
| NFPA Standards Addressed: | Unit(s) | Description |
| 1021-2-5.2 | 4 | Secure an incident scene |
| 1021-3-5.2 | 4 | Determine a point of origin and preliminary cause |
| 1033-3-2 | 2, 3 | Scene examination |
| 1033-3-2.1 | 4 | Secure the fire ground |
| 1033-3-2.2 | 4 | Conduct an exterior survey |
| 1033-3-2.3 | 4 | Conduct an interior survey |
| 1033-3-2.4 | 3, 4 | Interpret burn patterns |
| 1033-3-5.1 | 5 | Develop an interview plan |
| 1033-3-7.3 | 9 | Testify during legal procedures |
| Chief Fire Officer Designation Competencies Addressed: | www.cfainet.org This course provides partial fulfillment of CFOD: Competency #12 Investigations and Reporting Competency #14 Training Competency #15 Fire Suppression | |
| Point of Contact: | Edward Kaplan, United States Fire Administration (301) 447- 1127, ed.kaplan@fema.gov | |