FIR 206  Fire Investigation
Course Number  Course Title

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<th>3</th>
<th>3 Lecture Hours</th>
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<td>Credits</td>
<td>Hours: lecture/laboratory/other (specify)</td>
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**Catalog description:**
Provides the fundamental and technical knowledge needed for proper fire scene interpretations, including recognizing and conducting origin and cause, preservation of evidence and documentation, scene security, motives of the firesetter, and types of fire causes.

**Prerequisites:** None  **Corequisites:** None

**Is course New or Modified?**  No

**Required texts/other materials:**
ISBN- 978-1284026986

**Last revised:** Fall 2017

**Course coordinator:** James McCann, (609) 799-3245 or mccannj@mccc.edu

**Information resources:**
**U. S. Fire Administration**
Publications:
[http://www.usfa.fema.gov/applications/publications](http://www.usfa.fema.gov/applications/publications)

Applied Research:
[http://www.usfa.fema.gov](http://www.usfa.fema.gov)

Research Reports:
[http://www.usfa.fema.gov/research](http://www.usfa.fema.gov/research)

Technical Reports:

Topical Fire Research Series:
[http://www.usfa.fema.gov](http://www.usfa.fema.gov)

Learning Resource Center:
[http://www.lrc.fema.gov](http://www.lrc.fema.gov)
National Institute for Standards and Technology

References
Fire Investigator, Fire Protection Publications
Forensic Fire Scene Reconstruction, David Icove, Brady
Introduction to Fire Origin and Cause, Fire Protection Publications
Practical Fire and Arson Investigating, David Redsicker
NFPA 1033 Standard for Professional Qualifications for Fire Investigations

Other learning resources:
Lessons Learned Information Sharing:
http://www.llis.dhs.gov/member/secure/index.cfm
http://www.firearson.com
http://www.interfire.org/

Current Events/News
http://www.firehouse.com
http://www.fireengineering.com
http://www.withthecommand.com

Course goals:
The student will be able to:
• Identify and explain the responsibilities of the fire department from a firefighter's perspective when responding to the scene of a fire, including the possibility of incendiary devices often encountered.

• Define criminal law and explain the constitutional amendments (4th, 5th, 6th, 8th, 14th) as they apply to fire investigations.

• Analyze the precedents set by constitutional law case studies that have affected fire investigations.

• Define and explain the common terms used in fire investigations.

• Describe the basic elements of fire dynamics and how they affect cause determination including fire behavior, characteristics of fuels and methods of heat transfer.

• Analyze the relationship of building construction on fire investigations including types of construction, construction and finish materials.

• Evaluate fire protection systems and building services and discuss how their installation affects the ignition of fires in buildings.
• Discuss the basic principles of electricity.

• Explain the role of the fire investigator in recognizing health and safety concerns including potential hazardous materials awareness.

• Describe fire scene investigations and the process of conducting investigations using the scientific method.

• Explain how an investigator determines the point of origin in a room.

• Identify the types of fire causes and differentiate between accidental and incendiary causes.

• Describe and explain the basic procedures used for investigating vehicle fires.

• Identify the characteristics of arson and common motives of the firesetter.

• Identify and analyze the causes involved in line of duty firefighter deaths related to structural and wildland firefighting, training and research and the reduction of emergency risks and accidents.

Course-specific General Education Core Competencies and Goals.

General Education Knowledge Goals
Communication. Students will communicate effectively in both speech and writing.
Social Science. Students will use social science theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens.
History. Students will understand historical events and movements in World, Western, non-Western or American societies and assess their subsequent significance.
Diversity. Students will understand the importance of a global perspective and culturally diverse peoples.
Ethical Reasoning and Action. Students will understand ethical issues and situations.

MCCC Core Skills
Written and Oral Communication in English. Students will communicate effectively in speech and writing, and demonstrate proficiency in reading.
Critical Thinking and Problem-solving. Students will use critical thinking and problem solving skills in analyzing information.
Ethical Decision-Making. Students will recognize, analyze and assess ethical issues and situations.
Information Literacy. Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.
Collaboration and Cooperation. Students will develop the interpersonal skills required for effective performance in group situations.
Intra-Cultural and Inter-Cultural Responsibility. Students will demonstrate an awareness of the responsibilities of intelligent citizenship in a diverse and pluralistic society, and will demonstrate cultural, global, and environmental awareness.
Units of study in detail.

I. Emergency Responder Responsibilities and Observations
   A. Responsibilities of the Fire Department
   B. Responsibilities of the Firefighter
   C. Responsibilities of the Fire Officer
   D. Observations When Approaching the Scene
   E. Observations Upon Arrival
   F. Observations During Firefighting Operations
   G. Identification of Incendiary Devices

II. Constitutional Law
   A. Criminal Law
   B. Constitutional Amendments

III. Case Studies
   A. Michigan v. Tyler
   B. Michigan v. Clifford
   C. Daubert Decision
   D. Benfield Decision
   E. Kuhmo/Carmichael Decision

IV. Fire Investigations Terminology
   A. Terms as They Apply to Structural Fires
   B. Terms as They Apply to Vehicle Fires
   C. Other Common Investigative Terms

V. Basic elements of Fire Dynamics
   A. Ignition
   B. Heat Transfer
   C. Flame Spread
   D. Burning Rate
   E. Fire Plumes
   F. Fire Analysis

VI. Building Construction
   A. Types of Construction
   B. Building Materials
   C. Building Components

VII. Fire Protection Systems
   A. Extinguishment Systems
   B. Detection Systems
   C. Signaling Systems
   D. Other Building Services

VIII. Basic Principles of Electricity
   A. Basic Electricity
   B. Wiring Systems
   C. Common Electrical Systems

IX. Health and Safety
   A. Methods of Identification
B. Common Causes of Accidents
C. Common Causes of Injuries

X.  Fire Scene Investigations
A. Examining the Fire Scene
B. Securing the Fire Scene
C. Documenting the Fire Scene
D. Evidence Collection and Preservation
E. Exterior Examination

XI.  Determining Point of Origin
A. Interior Examination
B. Area of Origin
C. Fire Patterns
D. Other Indicators
E. Scene Reconstruction
F. Point of Origin

XII. Types of Fire Causes
A. Accidental
B. Natural
C. Incendiary
D. Undetermined

XIII. Vehicle Fires
A. Examination of Scene
B. Examination of Exterior
C. Examination of Driver and Passenger Areas
D. Examination of Engine Compartment
E. Examination of Fuel System
F. Examination of Electrical System

XIV. Firesetters
A. Characteristics of Arson
B. Common Motives

**Evaluation of student learning:** Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor. Periodic tests or quizzes as well as a final exam may be utilized. Other methods such as a research or group projects are encouraged.

**Academic Integrity Statement:** Mercer County Community College and the Fire Science program are committed to Academic Integrity -- the honest, fair and continuing pursuit of knowledge, free from fraud or deception. This implies that students are expected to be responsible for their own work and that faculty and academic support services staff members will take reasonable precautions to prevent the opportunity for academic dishonesty. The Fire Science program affirms its support of the Academic Integrity Policy as printed in the Student handbook and approved by the College Board of Trustees March 18, 2004.