

COURSE SYLLABUS

LAST REVIEW	Spring 2021
COURSE TITLE	Fire Arson Investigation
COURSE NUMBER	FRSC 0115
DIVISION	Health Professions
DEPARTMENT	Fire Science
CIP CODE	43.0203
CREDIT HOURS	3
CONTACT HOURS/WEEK	Class: 3
PREREQUISITES	None
COURSE PLACEMENT	Students must meet the correct placement measure for this course. Information may be found at: https://www.kckcc.edu/admissions/information/mandatory-evaluation-placement.html

COURSE DESCRIPTION

An orientation and introduction to arson and incendiarism, laws of arson, fire cause and fire and police investigation, and a technical analysis of arson and fraud are covered. Stress is placed on the collection and preservation of evidence, photography, diagrams and notes, interviewing, and the detention of witnesses. Motor vehicle fires, records, reports, briefs and court procedures are also examined.

PROGRAM LEARNING OUTCOMES

1. Demonstrate physical skills needed for employment as a firefighter.
2. Explain fire behavior.
3. Apply emergency management skills to provide basic emergency medicine in the field.
4. Evaluate strategy and tactics related to fire safety, survival techniques, and fire management.
5. Explain legal issues related to fire services administration.
6. Demonstrate employability skills necessary for completing the job search process.

TEXTBOOKS

<http://kckccbookstore.com/>

METHODS OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. INTRODUCTION
 - A. The Fire Problem
 - B. The Detection of Incendiary Fires
 - C. Analytical Fire Investigation

- II. THE ELEMENTARY CHEMISTRY OF COMBUSTION
 - A. Atoms, Elements, and Compounds
 - B. Organic Compounds
 - C. State of Fuel

- III. THE NATURE AND BEHAVIOR OF FIRE
 - A. Basic Combustion
 - B. Flaming Fire
 - C. Structure of Flames
 - D. Explosive Combustion
 - E. Heat
 - F. Sequence of a Room Fire
 - G. Effects of Environmental Conditions

- IV. COMBUSTION PROPERTIES OF LIQUID AND GASEOUS FUELS
 - A. Types of Fuel
 - B. Physical Properties of Fuels
 - C. Hydrocarbon Fuels
 - D. Non-hydrocarbon Liquid fuels
 - E. Pyrolysis and Decomposition of Liquids
 - F. Fuel Gas Sources

- V. COMBUSTION PROPERTIES OF SOLID FUELS
 - A. Pyrolysis
 - B. Combustion Properties of Wood
 - C. Paper
 - D. Plastics
 - E. Paint
 - F. Metals
 - G. Coal
 - H. Fire Behavior

- VI. SOURCES OF IGNITION
 - A. Primary Igniters
 - B. The Role of Services and Appliances in Starting Fires
 - C. The Role of Hot and Burning Fragments in Kindling Fires
 - D. Smoking as a Fire Origin
 - E. The role of Animals in Igniting fires
 - F. Miscellaneous Sources of ignition

- VII. STRUCTURE FIRES AND THEIR INVESTIGATION
 - A. Elements of Building Construction
 - B. General principles of Fire Behavior
 - C. Investigative Information During Suppression
 - D. Examination of a Structure Fire Scene
 - E. Documenting the Fire Scene
 - F. Conclusions about the Fire

- VIII. GRASS AND WILD LAND FIRES AND THEIR INVESTIGATION
 - A. Fuels
 - B. Fire behavior
 - C. Determination of Origin
 - D. Sources of Ignition
 - E. Collection and Preservation of Physical Evidence

- IX. AUTOMOBILE, MOTOR VEHICLE, AND SHIP FIRES
 - A. Automobiles and Motor Vehicles
 - B. Boats and Ships

- X. ELECTRICAL CAUSE OF FIRE
 - A. Basic electricity
 - B. Wiring System
 - C. Ignition by electrical Means
 - D. Investigation of Electricity-Related Fires

- XI. CLOTHING AND FABRIC FIRES
 - A. Types of Cloth
 - B. Fire Hazards
 - C. Regulations on Flammable Fabrics
 - D. Flammability of Mattresses and Upholstered Furniture
 - E. Flammability Testing

- XII. EXPLOSIONS AND EXPLOSIVE COMBUSTION
 - A. Explosive Combustion
 - B. Diffuse-Phase Explosions
 - C. Dense-Phase Explosions
 - D. Investigation of Explosions

- XIII. CHEMICAL FIRES AND HAZARDOUS MATERIALS
 - A. Gases
 - B. Liquids
 - C. Solids
 - D. Clandestine Drug Laboratories

- XIV. LABORATORY SERVICES
 - A. Availability of Laboratory Services
 - B. General Fire Evidence
 - C. Identification of Volatile Accelerants
 - D. Chemical Incendiaries
 - E. Non-Fire-Related Criminal Evidence

- XV. FIRE-RELATED DEATHS AND INJURIES
 - A. The Team Effort
 - B. Pathological and Toxicological Examination

- XVI. ARSON AS A CRIME
 - A. The Crime of Arson
 - B. Motive
 - C. The Arson Set
 - D. Deductions from the interpretation of Evidence

- XVII. OTHER INVESTIGATIVE TOPICS
 - A. Safety
 - B. Fire Modeling
 - C. Arson Law
 - D. Elements of Proof
 - E. Sources of Information
 - F. Spoliation
 - G. Chain of Evidence
 - H. Report Writing
 - I. Courtroom Testimony

COURSE LEARNING OUTCOMES

Upon successful completion of this course, the student will:

- A. Describe the scientific process of fire investigation.
- B. Describe the chemistry of combustion.
- C. Demonstrate an understanding of the nature and behavior of fire.
- D. Describe the combustion properties of liquid and gaseous fuels.
- E. Describe the combustion properties of solid fuels.
- F. Demonstrate an understanding of various sources of ignition.
- G. Demonstrate an understanding of how to conduct a structure fire investigation.
- H. Demonstrate an understanding of how to conduct a wildland fire investigation.
- I. Demonstrate an understanding of how to conduct a mobile vehicle fire investigation.
- J. Distinguish between an electrical, common combustible, explosive, hazardous material, and ignitable liquid fire.
- K. Demonstrate an understanding of forensics and laboratory services in fire investigation.
- L. Demonstrate an understanding of procedures involved in investigating fires resulting in injuries and fatalities.
- M. Demonstrate an understanding of court procedures and the laws governing fire investigation.

ASSESSMENT OF COURSE LEARNING OUTCOMES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>