DATE OF LAST REVIEW : 02/2013
CIP CODE: 43.0205
SEMESTER: Departmental Syllabus
COURSE TITLE: Fire Arson Investigation
COURSE NUMBER: FRSC-0115
CREDIT HOURS: 3
INSTRUCTOR: Departmental Syllabus
OFFICE LOCATION: Departmental Syllabus
OFFICE HOURS: Departmental Syllabus
TELEPHONE: Departmental Syllabus
EMAIL: KCKCC issued email accounts are the official means for electronically communicating with our students.

PREREQUISITE (S): None

REQUIRED TEXT AND MATERIALS:
Please check with the KCKCC bookstore, http://www.kckccbookstorecom/, for the required texts for your particular class.

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.

METHOD 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, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:
Course content may vary, but will generally include the following:

1. **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
EXPECTED LEARNER OUTCOMES:

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

COURSE COMPETENCIES:

Upon completion of the course the student will be able to demonstrate an understanding of the chemistry of combustion.

1. The student will be able to describe the combustion properties of solid gaseous fuels.
2. The student will be able to understand the elementary chemistry of combustion.
3. The student will be able to explain heat transfer.
4. The student will be able to describe the combustion properties of liquids.
5. The student will be able to discuss fuel compounds.
6. The student will be able to list the effects of the environment on the chemistry of combustion.
7. The student will be able to describe the combustion properties of solid fuels.

Upon completion of the course the student will be able to demonstrate an understanding of the nature and behavior of fire.

8. The student will be able to recognize the effects of temperature on the behavior of fire in confined spaces.
9. The student will be able to evaluate the dynamics of fire pattern development.
10. The student will be able to recognize unnatural low burn patterns.
11. The student will be able to explain the differences between flaming and glowing fire.
12. The student will be able to recognize the effects of humidity on the behavior of fire in confined spaces.
13. The student will be able to explain explosive combustion.

Upon completion of the course the student will be able to demonstrate an understanding of how to conduct a structure and vehicle fire investigation.

14. The student will be able to understand and use the systematic approach used to determine the point of origin, cause, and the travel of fire.
15. The student will be able to define the terms and language used by fire investigators.
16. The student will be able to list the proper way to collect and preserve evidence.
17. The student will be able to properly photograph a fire scene.
18. The student will be able to diagram a fire scene.
19. The student will be able to compose a fire investigation report.

Upon completion of the course the student will be able to demonstrate an understanding of the many and varied sources of ignition.

20. The student will be able to identify the seven primary igniters.
21. The student will be able to list several appliances common as a source of ignition.
22. The student will be able to discuss the role of hot and burning fragments as a source of ignition.
23. The student will be able to identify delayed devices used as a source of ignition.

Upon completion of the course the student will be able to demonstrate an understanding of court procedures and the laws governing fire investigation.

24. The student will be able to identify laws governing fire investigations.
25. The student will be able to identify the model arson law.
26. The student will be able to discuss court cases on arson.
27. The student will be able to prepare for court testimony.
28. The student will be able to explain the term motive as it relates to the laws governing fire investigation.
29. The student will be able to list five motives of fire setters.
30. The student will be able to understand the difference between criminal and civil litigation.

ASSESSMENT OF LEARNER OUTCOMES:
Assessment methods may include, but are not limited to, the following: Homework, Assignments, Quizzes, Class Participation, Chapter Tests, and Final Exam. The grading scale and the process for calculating the course grades are to be determined by the individual instructors. This information will be included in each instructor’s syllabus.

SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college’s policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the Academic Resource Center in Room 3354 or call 288-7670.