COURSE OUTLINE

Fire Investigation

Course Description
FS 180. Fire Investigation. 3 hours credit. Prerequisite: FS 100 or department consent. This course will enable the student to have a good understanding of arson and incendiarism, legal aspects of arson, and methods of setting incendiary fires. The student will gain knowledge of the various causes of fire, fire burn patterns, techniques for recognizing and preserving evidence, and means for interviewing and detaining witnesses. The student will learn about procedures utilized in handling juveniles, court procedures and the giving of court testimony are also covered.

Required Materials
For complete material(s) information, refer to https://bookstore.butlercc.edu

Butler-Assessed Outcomes
The intention is for the student to be able to
1. Demonstrate an understanding of the investigation methods for determining causes of fire and the ability to apply these methods.
2. Demonstrate an understanding of combustion properties of fuels, types of explosives, and incendiary devices.
3. Demonstrate an understanding of various types of fires and patterns.
4. Identify fire fatalities and causes.

Learning PACT Skills that will be developed and documented in this course
Through involvement in this course, the student will develop ability in the following PACT skill area(s):

Analytical Thinking Skills
• Problem solving - By analyzing information provided, the student will generate response to specific fire scenarios.

Technology Skills
• Discipline-specific technology - Through a variety of projects and assignments, the student will provide information relating to fire and arson investigation and the use of field related technology.

Major Summative Assessment Task(s)
These Butler-assessed Outcome(s) and Learning PACT skill(s) will be demonstrated by:
1. Demonstrate determination of acceptable responses to specific equipment used in fire and arson investigations
2. Verbalize proper action to be taken at various emergency situations in regard to fire investigation
Skills or Competencies
These actions are essential to achieve the course outcomes:
1. Identify various types of arson
2. Research past major fire loss records
3. Prepare written report of an arson/fire investigation

Learning Units
I. Introduction to fire investigation
   A. Introduction
   B. Roles and responsibilities
   C. Roles of other entities
   D. Legal considerations

II. Elementary chemistry of combustion
    A. Introduction
    B. Fire science
    C. Thermal energy

III. Nature and behavior of fire
     A. Introduction
     B. Stages of fire development
     C. Weather and its effects on fire behavior

IV. Combustion properties of non-solid fuel
    A. Introduction
    B. Fire science
    C. Liquid fires
    D. Gas fires

V. Role of pyrolysis
   A. Introduction
   B. Fire science
   C. Thermochemical decomposition

VI. Fire patterns of structural fires
    A. Introduction
    B. Exterior fire patterns
    C. Interior fire patterns
    D. Fire pattern analysis

VII. Sources of ignition
     A. Introduction
     B. Gathering and evaluating evidence
     C. Identification of heat sources
     D. Natural cause sources
     E. Intentional cause sources
VIII. Automobile fires
   A. Introduction
   B. Vehicle fire investigation
   C. Fire pattern analysis
   D. Cause and origin

IX. Practical investigation of structural fires
   A. Introduction
   B. Interview techniques
   C. Cause and origin
   D. Scientific method
   E. Scene preservation

X. Arson
   A. Introduction
   B. Scene security
   C. Intentional fire indicators
   D. Interview techniques
   E. Gathering and evaluating evidence

XI. The legal aspect of arson
   A. Introduction
   B. Legal considerations
   C. Chain of custody
   D. Documentation
   E. Utilizing outside agencies

XII. Carbon monoxide asphyxiation
   A. Introduction
   B. Atmospheric monitoring
   C. Intentional asphyxiation
   D. Accidental asphyxiation
   E. Signs and symptoms of carbon monoxide poisoning

XIII. Explosions associated with fires
   A. Introduction
   B. Fire science
   C. Smoke explosions
   D. Identifying explosion damage
   E. Safety

XIV. Fire fatalities
   A. Introduction
   B. Legal considerations
   C. Autopsies
D. Fire fatality causes
E. Mental health considerations

Learning Activities
Learning activities will be assigned to assist the student to achieve the intended learning outcomes through lecture, discussion, videos, online aids, hands on exercises, and other activities at the discretion of the instructor.

Grade Determination
The student will be graded on completion of assessment tasks, learning activities, participation (discussion), and the final project.