Course Outline/Syllabus
Illinois IDEA HS

1**. College/Division:** College of Education and Human Services, Western Illinois University

2. **Course Title**: Fire Investigation and Analysis

3. **Course Number**: Law Enforcement and Justice Administration, (LEJA) 486

4. **Credit Hours**: 3

5. **Instructor's Name**: William P. McCamey, PhD, Professor

6. **Catalog Description**: The course examines the technical, legal, and social aspects of arson, including principles of incendiary fire analysis and detection, environmental and psychological factors of arson, legal considerations, intervention, and mitigation strategies.

7. **Prerequisites**: LEJA 310 or permission of Director/Instructor. (contact your campus coordinator)

8. **Restrictions or suggestions**: High speed internet access required for this web course

9. **Rationale**: Fire and emergency service organizations in the United States operate in a constantly changing environment. This course prepares students to recognize and apply best practices in the investigation of fires and other emergency incidents, to conduct origin and cause determination procedures necessary to ascertain if the fire or emergency incident was accidental or deliberately initiated, to prepare the investigative reports necessary to document such analysis, and to apply the findings and knowledge acquired through such efforts to reduce the consequences of both accidental and intentional fires.

10. **Intended audience**: Individuals interested in emergency management, private security, private insurance investigation, fire service investigation, homeland security and law enforcement careers.

11. **Class size**: Maximum class size is 25 students, 7 openings will be reserved for Alliance students.

12. **Expected Student Outcomes/Course Objectives**:
    At the conclusion of the course, the student will be able to:
    - Demonstrate a technical understanding of characteristics and impacts of fire loss and the crime of arson necessary to conduct competent fire and other emergency incident investigations and analysis.

- Document an emergency scene, in accordance with best practices and legal requirements.
- Analyze the scene of the incident utilizing the scientific method, fire science and relevant technology.
- Analyze the legal foundation for conducting a systematic incendiary fire investigation and case preparation.
- Design and integrate a variety of arson related intervention and mitigation strategies.

13. **Required Texts**:
    - NFPA 921: *Guide for Fire and Explosion Investigations*, 2008, National Fire Protection Association.
    - *User's Manual for NFPA 921: Guide for Fire and Explosion Investigations*, 2005, 2nd edition, National Fire Protection Association.
    - RECOMMENDED ONLY: *Fire Protection Handbook*, Volume I and II, 2008, National Fire Protection Association.

14. **Topical/Subject Matter Outline/ Course Content**:
    - Data Trends, collection systems
    - Fire cause determinations
    - Motives
    - Sociological and cultural factors
    - Scientific method
    - Preservation of a scene
    - Fire patterns
    - Legal requirements of the investigative process
    - Methods of heat transfer
    - Physical, thermal, and chemical properties of solid, liquid, and gaseous fuels
    - Ignition process and fire growth
    - Fuel geometry and heat release rate
    - Fire plumes
    - Fire modeling (physical and computational)
    - Bench-scale versus full-scale fire testing
    - Probabilistic and deterministic fire models
    - Evidence
    - Case law
    - Incendiary mitigation programs
    - Arson-prone targets, prevention

15. **Course Activities**:
    - Written assignments and a certificate scoring activity. Assignments will be graded on content, grammar, and style.
    - Discussion questions: Each student will be able to extract expertise from training, education, and experience of other students. Students will be required to make

multiple posts to the Discussion Board and each posting must be a minimum of 125 words.

16. **Evaluation**:
    - Written assignments: 500 points
    - Discussion questions: 100 points

    A 540 to 600 points
    B 480 to 539 points
    C 420 to 479 points
    D 360 to 419 points
    F below 360 points

17. **Bibliography/References**:

- Behring, R. (2003). Restructuring Confidence in the Fire Safety of Buildings. *Fire Protection Engineering.*

- Caro, T.C., & Milke, J.A (1996). Survey of Fuel Loads in Contemporary Office Buildings, National Institute of Standards and Technology.

- *Fire Protection Handbook*, Volume I and II, 2008, National Fire Protection Association.

- Harmathy, T.Z. (1965). Ten Rules of Endurance Rating. *Fire Technology*.

- Harmathy, T.Z. & Lie, T.T. (1972). Fire Test Standards in the Light of Fire Research, Fire Test Performance. ASTM STP 464. American Society for Testing and Materials.

- Hirschler, M.M. (2004). Fire Testing of Interior Finishing. *Fire Protection Engineering.*

- Laymon, R. (2004). Assessing the Burning Characteristics of Interior Finish Material. *Fire Protection Engineering*.

- Tubbs, J. (2001). Intelligent Fire Alarm Systems. *Fire Protection Engineering*.