



Course Outline

2026-2027 Catalog

FSC 4 - Fundamentals of Fire Behavior and Combustion

Catalog Description

Transfer Status: CSU

Unit(s): 3.00

Lecture: 51.00 Contact hours/102.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

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Course Description: This course explores the theories and fundamentals of how and why fires start, spread and are controlled.

Objectives

Upon successful completion of this course, the student should be able to:

1. Identify the fundamental theories of fire behavior and combustion.
2. Differentiate the various types of distinguishing agents.
3. Identify physical properties of the three states of matter.
4. Categorize the components of fire.
5. Explain the physical and chemical properties of fire.
6. Describe and apply the process of burning.
7. Define and use basic terms and concepts associated with the chemistry and dynamics of fire.
8. Discuss various materials and their relationship to fires as fuel.
9. Demonstrate knowledge of the characteristics of water as a fire suppression agent.
10. Articulate other suppression agents and strategies.
11. Compare other methods and techniques of fire extinguishments.

Course Content

Topic Titles / Suggested Time Topic	
<u>Lecture</u>	
<u>Topics</u>	<u>Lec Hrs</u>
Introduction	1.00
Units of Measurement	2.00
Chemical Reactions	6.00
Fire and the Physical World	5.00
Heat and its Effects	5.00
Properties of Solid Materials	4.00
Common Flammable Liquids and Gases	4.00
Fire Behavior	8.00
Fire Extinguishment	8.00
Extinguishing Agents	6.00
Hazards by Classification Types	2.00
Total Hours: 51.00	

Methods of Instruction

- A. Demonstrations
- B. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- C. Lecture
- D. Multimedia Presentations
- E. Handout worksheets

Methods of Evaluation

- A. Quizzes
- B. Homework
- C. Written Examinations

Examples of Assignments

Reading Assignments

1. Read the chapter on hydrocarbons in the textbook, and be prepared to describe how the hazards and control methods of different classes of hydrocarbons are related to their structure.
2. Read the chapter on pressurized gases in the textbook, and be prepared to discuss how pressure, volume and temperature are related to pressurized gas hazards.

Writing Assignments

1. With the understanding that there are six key properties of flammable liquids to be aware of when faced with a flammable liquid emergency, write a paragraph about each property describing it and why it is important.
2. Prepare an organized notebook containing written outlines for each class lecture.

Out-of-Class Assignments

1. Research a fire or emergency situation that took place in an unusual environment, and be prepared to make a presentation to the class about the situation described.
2. Complete the assigned worksheet on hydrocarbons and be prepared to take a quiz in class.

Recommended Materials of Instruction

Frank L. Fire. (2009). Common Sense Approach to Hazardous Materials. *PennWell, Oklahoma, 3rd*.

Other Learning Materials

Handouts

Minimum Qualifications

Chemistry (Masters Required)

Fire Technology

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