# COURSE SYLLABUS

Fire Behavior and Combustion  
FST 103  
[Semester]  
CRN  
3 Credits

Instructor Name:  
Instructor Email:  
Instructor Phone:  
Office Hours:

## Class Meeting Dates/Location/Time:

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## Add/Drop Dates/Withdraw Dates

| Add/Drop Date: |  |
| Withdraw Date: |  |

[Other necessary information for students dropping or withdrawing from class]

## Co and Pre Requisites

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Course Description

Explores the theories and fundamentals of how and why fires start, spread, and are controlled.

Course Competencies

1. Identify the fundamental theories of fire behavior and combustion.
2. Differentiate the various types of extinguishing 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.

Topical Outline

I. Introduction
   A. Matter and Energy
   B. The Atom and its Parts
   C. Chemical Symbols
   D. Molecules
   E. Energy and Work
   F. Forms of Energy
   G. Transformation of Energy
   H. Laws of Energy

II. Units of Measurements
   A. International (SI) Systems of Measurement
   B. English Units of Measurement

III. Chemical Reactions
   A. Physical States of Matter
   B. Compounds and Mixtures
   C. Solutions and Solvents
   D. Process of Reactions
IV. Fire and the Physical World
   A. Characteristics of Fire
   B. Characteristics of Solids
   C. Characteristics of Liquids
   D. Characteristics of Gases

V. Heat and its Effects
   A. Production and Measurement of Heat
   B. Different Kinds of Heat

VI. Properties of Solid Materials
   A. Common Combustible Solids
   B. Plastic and Polymers
   C. Combustible Metals
   D. Combustible Dust

VII. Common Flammable Liquids and Gases
   A. General Properties of Gases
   B. The Gas Laws
   C. Classification of Gases
   D. Compressed Gases

VIII. Fire Behavior
   A. Stages of Fire
   B. Fire Phenomena
      a. Flashover
      b. Backdraft
      c. Rollover
      d. Flameover
   C. Fire Plumes

IX. Fire Extinguishment
   A. The Combustion Process
   B. The Character of Flame
   C. Fire Extinguishment
X. Extinguishing Agents  
   A. Water  
   B. Foams and Wetting Agents  
   C. Inert Gas Extinguishing Agents  
   D. Halogenated Extinguishing Agents  
   E. Dry Chemical Extinguishing Agents  
   F. Dry Powder Extinguishing Agents  

XI. Hazards by Classification Types  
   A. Hazards of Explosives  
   B. Hazards of Compressed and Liquefied Gases  
   C. Hazards of Flammable and Combustible Liquids  
   D. Hazards of Flammable Solids  
   E. Hazards of Oxidizing Agents  
   F. Hazards of Poisons  
   G. Hazards of Radioactive Substances  
   H. Hazards of Corrosives  

XII. Fundamentals of Wildland Fire Behavior and Combustion  
   A. Wildland Fuel characteristics  
   B. Characteristics of wildland fire ignition  
   C. Components of wildland fire spread  
   D. Methods of wildland fire control and extinguishment
Required Reading Materials and Supplies

[Course/Instructor Specific]

Technology Requirements

This course requires some online participation via Online Aims (Desire 2 Learn). Availability to a computer with internet access is required to obtain course information, complete assignments, and communicate via your college email account. You will need to allow time for technical malfunctions in order to meet required due dates. If you are having problems with Aims Online, please contact the helpdesk at 970-339-6380.

You will be required to utilize the online material provided by your textbook publisher for some assignments.

Computers are available on campus for student use. Please consult with your instructor if you have questions.

Attendance Requirements

[Course/Instructor Specific]
Course Evaluations:

Course Evaluations provide valuable feedback to Instructors. Students are encouraged to complete the online course evaluation survey during the last two weeks of the course. Other short course evaluations will be available at various times, depending on the course start and end times. Students will receive an email message directing them to a website where they can login using their Aims ID and complete evaluations. Course evaluations are confidential.

Standard Syllabus Policies

The standard syllabus academic policies are located at the following website: http://www.aims.edu/inside/policies/standard-syllabus/