1. COURSE ID: FIRE 730    TITLE: Fire Behavior and Combustion    C-ID: FIRE 140X
   Units: 3.0 units    Hours/Semester: 48.0-54.0 Lecture hours; and 96.0-108.0 Homework hours
   Method of Grading: Letter Grade Only
   Recommended Preparation:
      Eligibility for ENGL 100 or 105. FIRE 715

2. COURSE DESIGNATION:
   Degree Credit
   Transfer credit: CSU

3. COURSE DESCRIPTIONS:
   Catalog Description:
      This course explores the theories and fundamentals of how and why fires start, spread and are controlled.

4. STUDENT LEARNING OUTCOME(S) (SLO'S):
   Upon successful completion of this course, a student will meet the following outcomes:
   1. Identify the fundamental theories of fire behavior and combustion
   2. Differentiate the various types of extinguishing agents

5. SPECIFIC INSTRUCTIONAL OBJECTIVES:
   Upon successful completion of this course, a student will be able to:
   1. Identify the fundamental theories of fire behavior and combustion.
   2. Differentiate the various types of extinguishing agents.

6. COURSE CONTENT:
   Lecture Content:
      1. Introduction
         A. Matter and Energy
         B. The Atom and its Parts
         C. Chemical Symbols
            a. Chemical Equations
            b. Periodic Chart
            c. Atomic Weights/Mass
         D. Molecules
         E. Energy and Work
         F. Forms of Energy
            a. Source of Energy
            b. Sources of Ignition
         G. Transformation of Energy
         H. Laws of Energy
   2. Units Measurements
      A. International (SI) Systems of Measurement
         a. Units of Measurement for Mass/Energy
      B. English Units of Measurement
         a. Length, Size, Area, Volume
         b. Weight, Flow Rates, Pressure
   3. Chemical Reactions
      A. Physical States of Matter
      B. Compounds and Mixtures
      C. Solutions and Solvents
      D. Process of Reactions
         a. Oxidation/Reduction
         b. Combustion
         c. Exothermic/Endothermic
   4. Fire and the Physical World
      A. Characteristics of Fire
B. Characteristics of Solids
C. Characteristics of Liquids
D. Characteristics of Gases

5. Heat and its Effects
   A. Production and Measurement of Heat
   B. Different Kinds of Heat
      a. Heat of Combustion
      b. Heat of Solution
      c. Heat of Vaporization
      d. Specific Heat

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

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

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

9. Fire Extinguishment
   A. The Combustion Process
   B. The Character of Flame
   C. Fire Extinguishment

10. 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

11. 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 Poison
    G. Hazards of Radioactive Substances
    H. Hazards of Corrosives

7. REPRESENTATIVE METHODS OF INSTRUCTION:
   Typical methods of instruction may include:
   A. Lecture
   B. Activity
   C. Discussion

8. REPRESENTATIVE ASSIGNMENTS
   Representative assignments in this course may include, but are not limited to the following:
   **Writing Assignments:**
   Presentation topic description and outline
   **Reading Assignments:**
Assigned reading for class session

Other Outside Assignments:
Preparation of oral presentation

9. REPRESENTATIVE METHODS OF EVALUATION
Representative methods of evaluation may include:
A. Oral Presentation
B. Quizzes
C. Written examination

10. REPRESENTATIVE TEXT(S):
Possible textbooks include:

Origination Date: August 2020
Curriculum Committee Approval Date: October 2020
Effective Term: Fall 2021
Course Originator: Michelle Schneider