

**Mt. San Jacinto College
Integrated Course Outline of Record**

Form B

Submitted by:	Mike Spaulding	Date:	10/11/2018
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Department	Subject	Course Number	Title
Fire Technology	Fire Technology FIRE	109	Fundamentals of Fire Protection and Equipment

Units/Hours

Each lecture unit requires 1 hour per week of class time, and 2 hours per week of study outside of class.

Each laboratory unit requires 3 hours per week of class time.

Each activity unit requires 2 hours per week of class time and 1 hour per week of study outside of class.

Lecture Units

3.00

Total Units

3.00

**Lecture
Contact Hours**

48.00 - 54.00

**Total Contact
Hours**

48.00 - 54.00

**Lecture
Homework
Hours**

96.00 - 108.00

Stand Alone:

Program Applicable

AA/AS Degree General Ed Breadth Area(s):

-none-

General Education Justification:

Maximum Enrollment:
Maximum Enrollment
Justification:

40

Course requires significant individualized instruction or assessment “ check all that apply:

- * Course requires graded class discussion and graded class participation.
- * Course relies on small group dynamics as a means of instruction

or assessment.

Justification: smaller class size is needed to better facilitate group projects and discussions

Grading Method:

Letter Grade or P/NP

TOP code:

2133.00*

Can be Taken

1

time(s) for credit (max 4)

- Visual or Performing Arts course that is required to meet major requirements for UC/CSU

- Intercollegiate athletics course

- Academic/vocational competition course

Catalog Description:

(Please do not refer to transferability or degree, certificate, or employment concentration applicability. Please only describe the course). (75 words or less in gray box below).

This course provides information relating to the features of design and operation of fire detection and alarm systems, heat and smoke control systems, special protection and sprinkler systems, water supply for fire protection, and portable fire extinguishers.

Schedule Description:

(Please do not refer to transferability or degree, certificate, or employment concentration applicability. Please only describe the course). (25 words or less in gray box below).

This course will provide the student with fundamental information on basic types of fire protection equipment and systems.

Need for the course:

This course provides a fundamental knowledge of fire protection systems and equipment and is a required core course towards a certificate or Associate of Science Degree in Fire Technology.

Prerequisite(s):

Prerequisites go through a separate approval process. See Forms E1-E6 for details.

(For further clarification, contact the Prerequisite Subcommittee)

- FIRE 101 with a Grade of C or better. or

Corequisite(s):

Corequisites go through a separate approval process. See Forms E1-E6 for details.

- FIRE 101

Recommend Preparation:

Recommended Preparation goes through a separate approval process. See Forms E1-E6 for details.

-none-

Other Enrollment Criteria:

-none-

Learning Objectives:

(please number each objective and express in behavioral terms)

Upon the completion of the course the student will be able to do the following:

1. Examine the benefits of fire protection systems in various types of structures.
2. Diagram the basic elements of a public water supply system including sources, distribution networks, piping and hydrants.
3. Validate why water is a commonly used extinguishing agent.
4. Categorize the different types and components of sprinkler, standpipe and foam systems.
5. Analyze residential and commercial sprinkler legislation.
6. Compare the different types of non-water based fire suppression systems.
7. Diagram the basic components of a fire alarm system.
8. Diagram the different types of detectors and analyze how they detect fire.
9. Examine the hazards of smoke and list four factors that can influence smoke movement in a building.
10. Choose the appropriate application of fire protection systems.
11. Compare and contrast the operation and appropriate application for the different types of portable fire protection systems.

Course Content:

(please number the outline of main topics and subtopics)

1. INTRODUCTION TO FIRE PROTECTION SYSTEMS
 1. The role fire protection systems play in protecting the life, safety and welfare of the general public and firefighters
 2. Overview of different types of fire protection systems
 3. The role of codes & standards in fire protection system design
2. WATER SUPPLY SYSTEMS FOR FIRE PROTECTION SYSTEMS
 1. Sources of fire protection water supply
 2. Distribution networks
 3. Piping
 4. Hydrants
 5. Utility company interface with the fire department
3. WATER-BASED FIRE SUPPRESSION SYSTEMS
 1. Properties of water
 1. Water as an effective extinguishing agent
 2. How water extinguishes fire
 2. Sprinkler Systems
 1. Types of systems & applications
 2. Types of sprinklers & application
 3. Piping, valves, hangers & alarm devices
 4. Fire Department operations in buildings with sprinklers
 3. Residential sprinkler systems
 4. Standpipe systems
 1. Types & application
 2. Fire Department operations in buildings with standpipes
 5. Foam systems
 6. Water mist systems
 7. Fire pumps
 1. Types
 2. Components
 3. Operation
 4. Fire pump curves
4. Non-water-based fire suppression systems
 1. Carbon dioxide systems

1. Application
 2. Extinguishing properties
 3. System components
2. Halogenated systems
 1. Halon 1301 and the environment
 2. Halon alternatives
 3. Extinguishing properties
 4. System components
3. Dry/Wet chemical extinguishing systems
 1. Extinguishing properties
 2. Applications
 3. UL 300
5. Fire alarm systems
 1. Components
 2. Types of alarm systems
 3. Detectors
 1. Smoke
 2. Heat
 3. Flame
 4. Audible/visual devices
 5. Alarm monitoring
 6. Testing & maintenance of fire alarm systems
6. Smoke management systems
 1. Hazards of smoke
 2. Smoke movement in buildings
 3. Types of smoke management systems
 4. Firefighting operations in buildings with smoke management systems
7. Portable fire extinguishers
 1. Types & application
 2. Selection
 3. Placement
 4. Maintenance
 5. Portable fire extinguisher operations

Methods of Instruction:

Methods of instruction may include, but are not limited to the following:

- **Method:** Lecture
Integration: Lecture presentation using PowerPoint and other media presentations will: explain the benefits of fire protection systems in various types of structures, describe the basic elements of a public water supply system including sources, distribution networks, piping and hydrants and explain why water is a commonly used extinguishing agent.
- **Method:** Observation and Demonstration
Integration: PowerPoint slides, and other forms of media, may be used to identify the different types and components of sprinkler, stand pipe and foam systems, along with identifying the different types of detectors and explain how they detect fire.
- **Method:** Discussion
Integration: In-class and/or group discussion will be used to enhance the students understanding of concepts such as the hazards of smoke and the four factors that influence smoke movement in a building and to discuss the appropriate application of fire protection systems.
- **Method:** Activity
Integration: Hands on activities utilizing a variety of fire detection equipment, in-class group discussions and research assignments will be used to analyze a variety of case situations.

- **Method:** Homework

Integration: Out of class reading assignments and summaries of that reading will enhance student comprehension of basic material and to help meet the student learning outcomes.

Methods of Evaluation:

A student's grade shall be determined by the instructor using multiple measures of performance related to the course objectives. Methods of evaluation may include but are not limited to the following:

- **Method:** Exams/Tests

Integration: Quizzes, a midterm and final examination will be used to evaluate student understanding of terminology, knowledge of subject matter, and ability to contrast and evaluate types of fire protection systems, water supply systems, components of fire alarm systems and portable fire protection systems.

- **Method:** Research Projects

Integration: Students will be evaluated on a research paper that analyzes different types of fire protection systems in various types of construction and occupancy types. Writing skills as well as assignment content, accuracy and research sources will be evaluated.

- **Method:** Homework

Integration: Students will conduct written research assignments related to fire protection systems. Students will be evaluated on writing skills and assignment accuracy.

- **Method:** Class Participation

Integration: Students will be encouraged to participate in class discussions and activities and will be evaluated on their involvement and performance in the discussions and class activities.

Examples of Assignments:

Students will be expected to understand and critique college level texts or the equivalent. Reading and writing, as well as out of class assignments are required. These assignments may include but are not limited to the following:

1. Individual research, application, and written assignment:

1. Within a given scenario the student will analyze, prepare, and present a fire protection system that demonstrates complete coverage for the following occupancies: a) residential; b) commercial; c) industrial; d) school occupancy with regards to sprinkler, hood & duct and special application protection. The student will list and diagram the different types and components of sprinkler, standpipe and foam systems. In written format, the student will compare and contrast the seven types of fire alarm systems, give examples of each.

2. Group research assignment

- A. As a member of a group, the student will research and list the benefits of fire protection systems in various types of structures and occupancies. The benefits listed will include the benefits to the building occupants, to firefighters and firefighting activities.

Textbooks:

- Matthew J. Claus & Jonathan Hart (2017). *NFPA 25: Water Based Fire Protection Systems Handbook* NFPA. ISBN: 978-1455914555
- Jones Jr. A. M. (2015). *Fire Protection Systems* Jones & Bartlett Learning. ISBN: 9781284035377

Other Resources:

Minimum Qualification

- Fire Technology

