FT R155: FIRE PROTECTION EQUIPMENT AND SYSTEMS

Originator
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College
Oxnard College

Discipline (CB01A)
FT - Fire Technology

Course Number (CB01B)
R155

Course Title (CB02)
Fire Protection Equipment and Systems

Banner/Short Title
Fire Protection Equipment/Sys

Credit Type
Credit

Start Term
Fall 2021

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

Taxonomy of Programs (TOP) Code (CB03)
2133.00 - *Fire Technology

Course Credit Status (CB04)
D (Credit - Degree Applicable)

Course Transfer Status (CB05) (select one only)
B (Transferable to CSU only)

Course Basic Skills Status (CB08)
N - The Course is Not a Basic Skills Course

SAM Priority Code (CB09)
C - Clearly Occupational

Course Cooperative Work Experience Education Status (CB10)
N - Is Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB11)
Y - Credit Course

Educational Assistance Class Instruction (Approved Special Class) (CB13)
N - The Course is Not an Approved Special Class

Course Prior to Transfer Level (CB21)
Y - Not Applicable

Course Noncredit Category (CB22)
Y - Credit Course

Funding Agency Category (CB23)
Y - Not Applicable (Funding Not Used)

Course Program Status (CB24)
1 - Program Applicable

General Education Status (CB25)
Y - Not Applicable

Support Course Status (CB26)
N - Course is not a support course

Field trips
Will not be required

Grading method
Letter Graded

Does this course require an instructional materials fee?
No

Repeatable for Credit
No

Is this course part of a family?
No

Units and Hours

Carnegie Unit Override
No

In-Class

Lecture
Minimum Contact/In-Class Lecture Hours
52.5
Maximum Contact/In-Class Lecture Hours
52.5

Activity

Laboratory

Total in-Class

Total in-Class
Total Minimum Contact/In-Class Hours
52.5
Total Maximum Contact/In-Class Hours
52.5

Outside-of-Class

Internship/Cooperative Work Experience

Paid

Unpaid

Total Outside-of-Class

Total Outside-of-Class
Minimum Outside-of-Class Hours
105
Maximum Outside-of-Class Hours
105

Total Student Learning

Total Student Learning
Total Minimum Student Learning Hours
157.5
Total Maximum Student Learning Hours
157.5

Minimum Units (CB07)
3
Maximum Units (CB06)
3

Prerequisites
FT R151 or concurrent enrollment

Entrance Skills

Entrance Skills
Students need to have an understanding of the educational requirements of the firefighter position and be able to identify changes in fire protection for the safety of the public.

Prerequisite Course Objectives
FT R151-Describe the educational requirements, duties, and information sources for various occupations in fire protection.
FT R151-Identify the effects of fire on the environment and the historical reactions made to protect society.

Requisite Justification

Requisite Type
Concurrent

Requisite
FTR151

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Prerequisite

Requisite
FT R151

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Student Learning Outcomes (CSLOs)

	Upon satisfactory completion of the course, students will be able to:
1	Identify different types of automatic sprinkler and other extinguishing systems.
2	Identify the different classes of portable fire extinguishers.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1	Compare smoke and fire movement in various types of construction, and the relationship to systems and equipment.
2	Describe organizations that provide information or service to fire protection systems.
3	Define the types, classifications, and effectiveness ratings of fire extinguishers.
4	Describe distribution, installation, and test requirements for fire extinguishers.
5	Identify types, components and operation of fire protection systems and equipment for special hazards.
6	Explain water supply requirements, distributions systems, and testing for public and private fire protection.
7	Explain the application of hydraulic theory for fire protection.
8	Identify types, components and operations of automatic and special sprinkler systems.
9	Identify types of standpipe systems and water supply requirements.
10	Compare detection, alarm, and supervisory devices and systems.
11	Compare heat and smoke control devices and hardware.
12	Explain why water is a commonly used extinguishing agent.
13	Review residential and commercial sprinkler legislation.
14	Identify the different types of non-water based fire suppression systems.
15	Describe the hazards of smoke and list the four factors that can influence smoke movement in a building.

Course Content

Lecture/Course Content

1. Fire Cause and Effect Overview
   a. Hazards of Materials
   b. Building Construction
   c. Heat and Smoke Control
2. Portable Fire Extinguishers
   a. Description and Classification
   b. Effectiveness and Ratings
   c. Distribution and Installation
   d. Types: Application, Operation, Inspection and Maintenance
3. Characteristics of Protection Systems and Equipment for Special Hazards
   a. General Arrangement and Equipment for Special Hazards
   b. Carbon Dioxide Systems
   c. Dry Chemical Systems
   d. Foam: Protein, AFFF, Class A
   e. Foam: High Expansion
   f. Emulsifiers and Chemical Surfactant
   g. Water Spray Systems
   h. Inert Gas Blanketing
   i. Halogenated Hydrocarbon Agent Systems

   j. Explosion and Suppression Systems
   k. Engineered and Pre-Engineered Systems
4. Public and Private Water Supplies, Equipment, and Services for Fire Protection
   a. Elementary Principles of Hydraulics
   b. Water Supplies for Community Fire Protection
   c. Fire Protection Requirements, Public/Private Water Systems
   d. Water Supply Testing Fundamentals
5. Sprinkler Protection
   a. Types of Sprinkler Systems
      i. Wet Pipe
      ii. Dry Pipe
      iii. Preaction
      iv. Combined Dry Pipe and Preaction
      v. Deluge, High Density, Hydraulically Designed Systems
   b. Standard Installation Requirements
   c. Special Hazards and Installations Conditions
   d. Exposure Protection
   e. Plans Review Procedure
   f. Inspection and Testing Procedures
   g. Residential Sprinkler Systems
6. Protective Signaling Systems
   a. Local Signaling Systems
   b. Auxiliary Signaling Systems
   c. Remote Station Systems
   d. Proprietary Systems
   e. Emergency Voice/Alarm Communications Systems
   f. Central Station Systems
   g. Types of Signals
   h. Protective Signaling Systems Circuits
   i. Interfacing with Municipal Signaling Systems
7. Standpipe Systems
   a. Class I
   b. Class II
   c. Class III
   d. Combined Systems
8. Heat and Smoke Control Systems
   a. Fire Doors, Windows, and Walls
   b. Fire Shutters
   c. Smoke and Fire Dampers
   d. Curtain Boards
   e. Smoke Towers
   f. Mechanical Roof Vents

Laboratory or Activity Content

None

Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

Problem solving exercises
Written expression

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Computational homework
Essays
Group projects
Individual projects
Objective exams
Oral presentations

Problem-Solving Assignments
Problem-solving exams
Quizzes
Role playing
Reports/papers
Research papers
Simulations

Instructional Methodology

Specify the methods of instruction that may be employed in this course

Computer-aided presentations
Class activities
Class discussions
Case studies
Distance Education
Demonstrations
Group discussions
Instructor-guided use of technology
Internet research
Lecture
Role-playing
Small group activities

Describe specific examples of the methods the instructor will use:

1. Instructor will direct interactive instructional activities asking students to research requirements of fire protection devices in different types of occupancies.
2. Instructor will present information on the different types of extinguishing systems for different types of occupancies.
3. Instructor will present information on Class ABCD fire extinguishers.
4. Instructor will lead group activities identifying proper fire sprinkler activation, operation, shutdown and maintenance procedures.
5. Instructor will develop small group exercises in which the students will identify different type of occupancies and the specific hazards associated.
6. Instructor will lead guided and focused discussions on fire protection devices in public assemblage occupancies.

Representative Course Assignments

Writing Assignments

1. Homework assignments, covering all chapters in the textbook.
2. Term paper required on one of the chapter subjects.

Critical Thinking Assignments

1. Participate in small group discussions focusing on methods automatic sprinkler operation.
2. Participate in online discussions concerning the history of significant fires and how they shaped the future of fire protection devices.
3. Participate in focus groups concerning the advent of fire protection for civilians in high rise office buildings.
4. Participate in group activities and develop minimum standards for residential fire protection.
5. Identify training programs for civilian use escape procedures.

Reading Assignments

1. Current Technical Periodicals including publications of the American Fire Sprinkler Association
2. Current Technical Periodicals including publications of the California Fire Alarm Association
3. The American Fire Journal

Other assignments (if applicable)

None

Outside Assignments

Representative Outside Assignments

1. Students are assigned one chapter per week to read.
2. Students are required to complete a weekly quiz on the assigned chapter.

3. Students will research fire protection devices for various occupancies.
4. Students will complete one research project on fire protection systems.
5. Students will present their finding to the class on the following topics: automatic sprinklers, exits, fire department connections and smoke control devices.

Articulation

C-ID Descriptor Number
FIRE 120 X

Status
Approved

District General Education

A. Natural Sciences

B. Social and Behavioral Sciences

C. Humanities

D. Language and Rationality

E. Health and Physical Education/Kinesiology

F. Ethnic Studies/Gender Studies

CSU GE-Breadth

Area A: English Language Communication and Critical Thinking

Area B: Scientific Inquiry and Quantitative Reasoning

Area C: Arts and Humanities

Area D: Social Sciences

Area E: Lifelong Learning and Self-Development

CSU Graduation Requirement in U.S. History, Constitution and American Ideals:

IGETC

Area 1: English Communication

Area 2A: Mathematical Concepts & Quantitative Reasoning

Area 3: Arts and Humanities

Area 4: Social and Behavioral Sciences

Area 5: Physical and Biological Sciences

Area 6: Languages Other than English (LOTE)

Textbooks and Lab Manuals

Resource Type
Textbook

Description
- (2016). *Fire Detection and suppression Systems* (5th). IFSTA 978-0-87939-599-5.

Resource Type
Other Resource Type

Description
National Fire Protection Association Handbook, 2008, NFPA.

Resource Type
Other Resource Type

Description
California Code of Regulation, Title 19 .

Resource Type
Other Resource Type

Description
National Fire Protection Association Standards, 2008, NFPA.

Distance Education Addendum

Definitions

Distance Education Modalities
Hybrid (51%–99% online)
Hybrid (1%–50% online)
100% online

Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.
Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.
Yes

Regular Effective/Substantive Contact

Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Students will post a discussion board topic on a loss of life incident and how fire protection devices would have prevented it.

Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Students will post a discussion board topic on a loss of life incident and how fire protection devices would have prevented it.

Synchronous Dialog (e.g., online chat)	Students will share their thoughts of the online lecture in an online chat with their classmates.

100% online Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Students will post a discussion board topic on a loss of life incident and how fire protection devices would have prevented it.
Synchronous Dialog (e.g., online chat)	Students will share their thoughts of the online lecture in an online chat with their classmates.
Other DE (e.g., recorded lectures)	Students will meet online with Instructor via Zoom.

Examinations

Hybrid (1%–50% online) Modality
Online
On campus

Hybrid (51%–99% online) Modality
Online
On campus

Primary Minimum Qualification
FIRE TECHNOLOGY

Review and Approval Dates

Department Chair
05/20/2020

Dean
05/20/2020

Technical Review
8/26/2020

Curriculum Committee
8/26/2020

Curriculum Committee
11/25/2020

CCCCO
MM/DD/YYYY

Control Number
CCC000077329

DOE/accreditation approval date
MM/DD/YYYY