The fire service is one of the most dynamic employers in the country. This CRC program is designed to provide the student with updated skills and knowledge necessary to complete and successfully apply for fire service positions. The curriculum serves as an inservice program as well as a pre-employment program for students seeking employment or advancement in the profession of urban fire fighting and fire suppression.

FIRE TECHNOLOGY DEPARTMENT (/ACADEMICS/FIRE-TECHNOLOGY)
The fire service is one of the most dynamic employers in the country. This CRC program is designed to provide the student with updated skills and knowledge necessary to complete and successfully apply for fire service positions. The curriculum serves as an inservice program as well as a pre-employment program for students seeking employment or advancement in the profession of urban fire fighting and fire suppression.

**HIGHLIGHTS**

- Up-to-date technical information
- Field trips to a variety of fire service locations
- Networking with other fire service members
- Fire Technology work experience internships  
  (Fire Technology 498 for on-the-job experience)

**NOTE TO TRANSFER STUDENTS:**
If you are interested in transferring to a four-year college or university to pursue a bachelor’s degree in this major, it is critical that you meet with a CRC counselor to select and plan the courses for your major. Schools vary widely in terms of the required preparation. The courses that CRC requires for an Associate’s degree in this major may be different from the requirements needed for the Bachelor’s degree.

**Catalog Date:** June 1, 2019

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT 300</td>
<td>Fire Protection Organization</td>
<td>3</td>
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<tr>
<td>FT 301</td>
<td>Fire Prevention Technology</td>
<td>3</td>
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<tr>
<td>FT 302</td>
<td>Fire Protection Equipment and Systems</td>
<td>3</td>
</tr>
<tr>
<td>FT 303</td>
<td>Building Construction for Fire Protection</td>
<td>3</td>
</tr>
<tr>
<td>FT 304</td>
<td>Fire Behavior and Combustion</td>
<td>3</td>
</tr>
<tr>
<td>FT 305</td>
<td>Firefighter Safety and Survival</td>
<td>3</td>
</tr>
<tr>
<td>FT 320</td>
<td>Hazardous Materials</td>
<td>3</td>
</tr>
<tr>
<td>EMT 100</td>
<td>Emergency Medical Technician</td>
<td>7.5(^1)</td>
</tr>
<tr>
<td>FT 498</td>
<td>Work Experience in Fire Technology (1 -4)</td>
<td>1 - 4(^2)</td>
</tr>
<tr>
<td>A minimum of 9 units from the following:</td>
<td></td>
<td>9</td>
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<tr>
<td>FT 110</td>
<td>Fire Apparatus (3)</td>
<td></td>
</tr>
<tr>
<td>FT 130</td>
<td>Fire Company Organization and Management (3)</td>
<td></td>
</tr>
<tr>
<td>FT 170</td>
<td>Fire Investigation (3)</td>
<td></td>
</tr>
<tr>
<td>FT 180</td>
<td>Rescue Practices (3)</td>
<td></td>
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<tr>
<td>FT 190</td>
<td>Fire Tactics and Strategy (3)</td>
<td></td>
</tr>
<tr>
<td>FT 210</td>
<td>Firefighter Academy for the Internship Program (7.5)</td>
<td></td>
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</table>

Total Units: 38.5 - 41.5
A current California EMT certificate or Paramedic license will be accepted as satisfactory completion of the EMT 100 requirement.

The student must have 1-4 units of work experience in Firefighting or Emergency Medical Services to receive a degree.

The Fire Technology Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO #1: Comprehend the qualifications for entry level skills, the discipline and evaluation process, fire service structure, history, and culture for the field of fire technology.
- Analyze, appraise, and evaluate fire incidents and components of emergency management and firefighter safety.
- PSLO #2: Comprehend laws, regulations, codes, standards and the regulatory and advisory organizations that influence fire department operations.
- PSLO #3: Analyze and determine the causes of fire, extinguishing agents, stages of fire, fire development, and methods of heat transfer.
- Synthesize and determine the appropriate use and flow requirement of hydraulic fire apparatus.
- Describe the appropriate uses and maintenance for apparatus and equipment used in the fire service.
- PSLO #4: Evaluate the common types of building construction and conditions associated with structural collapse and firefighter safety.
- Evaluate fire detection and fire suppression systems.

Career Information

Firefighter; Inspector; Investigator; Supervisor; Manager Some career options may require more than two years of college study. Classes beyond the associate degree may be required to fulfill some career options or for preparation for transfer to a university program.

Fire Technology Certificate

Firefighter Suppression Specialist Certificate
The fire service is one of the most dynamic employers in the country. This CRC program is designed to provide students with updated skills and knowledge necessary to complete and successfully apply for fire service positions. The purpose of the Fire Suppression Specialist Certificate is to recognize, through certification, qualified individuals who are dedicated to curtailing fire loss, both physical and financial, and who have acquired a level of professionalism through applied work experiences and related education opportunities, and through successful completion of a certification examination.

The curriculum serves as an in-service program as well as a pre-employment program for students seeking employment or advancement in the profession of urban fire fighting, fire prevention, and public and private fire suppression.

**HIGHLIGHTS**

- Up-to-date technical information
- Field trips to a variety of fire service locations
- Networking with other fire service members
- Fire Technology work experience internships (Fire Technology 498 for on-the-job experience)

**Catalog Date:** June 1, 2019

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
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<tr>
<td>FT 300</td>
<td>Fire Protection Organization</td>
<td>3</td>
</tr>
<tr>
<td>EMT 100</td>
<td>Emergency Medical Technician</td>
<td>7.5(^1)</td>
</tr>
<tr>
<td>FT 210</td>
<td>Firefighter Academy for the Internship Program</td>
<td>7.5</td>
</tr>
<tr>
<td>FT 320</td>
<td>Hazardous Materials</td>
<td>3</td>
</tr>
<tr>
<td>FT 498</td>
<td>Work Experience in Fire Technology (1 - 4)</td>
<td>16(^2)</td>
</tr>
<tr>
<td>Total Units</td>
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</tr>
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</table>

\(^1\)A current California EMT certificate or Paramedic license will be accepted as satisfactory completion of the EMT 100 requirement.

\(^2\)Students should take 4 units of Fire Technology Work Experience (FT 498) each semester for 4 semesters, earning a total of 16 units of work experience through FT 498.

**Student Learning Outcomes**

Upon completion of this program, the student will be able to:
• PSLO 1: Comprehend the qualifications for entry level skills, the discipline and evaluation process, fire service structure, history, and culture for the field of fire technology.

• PSLO 2: Analyze, appraise, and evaluate fire incidents and components of emergency management and firefighter safety.

• Comprehend laws, regulations, codes, standards, and the regulatory and advisory organizations that influence fire department operations.

• PSLO 3: Develop policies, procedures, and training programs to inform and educate population in fire prevention principles and fire and life safety practices; understand proper design, installation, and maintenance of electrical systems and appliances while identifying the components that, alone or in combination, form emergency and standby power systems; analyze the dynamics of heating systems; identify basic components of and the hazards associated with ‘hot work’ and the manufacturing processes necessary for effective fire prevention.

• PSLO 4: Analyze facility fire hazard management to include capturing knowledge of property fire insurance, building construction and/or field experience; performing fire/property surveys involving detailed analyses; observation, examination, inspection, and gathering of data to describe all aspects of a property/building and business; conducting complex inspection surveys of commercial and residential properties to evaluate physical characteristics of a property and business.

• PSLO 5: Recognize system approaches to property classes; assessing life safety as it relates to fire protection in special occupancies and understanding fire protection in warehouse and storage operations.

• Evaluate fire detection and fire suppression systems.

• PSLO 6: Define organizations for fire and rescue services; perform pre-incident planning for industrial and commercial facilities, interpret operations of fire loss prevention and emergency organizations, understand operations of emergency medical services, describe municipal fire prevention and code enforcement operations; train fire and emergency services; understand the use and function of fire and emergency services protective clothing and protective equipment; and evaluate fire department resources and the placement thereof.

Career Information

Firefighter; Fire Inspector; Investigator; Supervisor; Manager, Plans Examiner; Building Inspector; Fire Prevention Specialist/Officer; Public Education Specialist/Officer

Fire Technology (FT)

FT 110 Fire Apparatus
This course covers various aspects of fire apparatus. Topics include design, typing, specifications, construction, performance capabilities, and maintenance. This course includes principles and techniques for maintaining and operating fire service pumping and other mobile apparatus. The course includes fire service equipment and apparatus troubleshooting; principles and techniques of preventive maintenance; construction and operation of fire service pumps and pump accessories; basic highway operating techniques for fire apparatus; fire apparatus specifications and testing procedures. Also included are warning devices and the utilization of apparatus in fire service emergencies. Effective utilization of equipment on the fireground will be the focus with emphasis on practical applications.

<table>
<thead>
<tr>
<th>Units:</th>
<th>3</th>
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<tbody>
<tr>
<td>Hours:</td>
<td>54 hours LEC</td>
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<tr>
<td>Prerequisite:</td>
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<td>Advisory:</td>
<td>FT 130; FT 300; or employment as a firefighter</td>
</tr>
<tr>
<td>Catalog Date:</td>
<td>June 1, 2019</td>
</tr>
</tbody>
</table>

Student Learning Outcomes

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

- SLO 1: Analyze, appraise, and evaluate fire incidents and components of emergency management and firefighter safety.
- analyze fire case study scenarios and formulate solutions.
- SLO 2: Synthesize and determine the appropriate use and flow requirement of hydraulic fire apparatus.
- list and explain the principles of pumping operations.
- SLO 3: Describe the appropriate uses and maintenance for apparatus and equipment used in the fire service.
- compare and contrast the design characteristics of aerial ladder trucks.
- describe operating principles of fully-hydraulic aerial, hydro-mechanical aerial, and manual-emergency operational procedures.
- explain the types of fire ground scenarios in which elevating platform apparatus would be used.
- describe types of platform apparatus; explain their comparative use under different kinds of conditions.
- analyze the hazards associated with the use of fire apparatus under emergency conditions.
- describe the use of specialized equipment such as fireboats, airport apparatus, etc.
- describe the components and the importance of systems checks for the maintenance of fire apparatus.
- prepare apparatus inspection records.
- describe safety procedures and records to be kept for safe use of all fire apparatus.
An in-depth review of the operation, organization and planning concepts of today's fire departments. Emphasizes the functions of management including budgeting, time management, delegation, motivation, and discipline. Explores concepts of continuous improvement, team-building, and principles of quality management, relative to fire service operations.

### Student Learning Outcomes

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

- **SLO 1**: Comprehend the qualifications for entry level skills, the discipline and evaluation process, fire service structure, history, and culture for the field of fire technology.
- describe a fire department's organizational structure.
- analyze the relationships between and among segments of fire departments.
- describe methods of departmental communications.
- identify and describe the general functions of management.
- compare various management styles and examine style outcomes and results.
- describe the system of progressive discipline.
- develop work flow plans.
- explain the importance and procedure of evaluations.
- compare and contract team-building strategies and explain the importance of team functions in the fire department.
- describe the company's role in coordinating with other public/private agencies.
- **SLO 2**: Comprehend laws, regulations, codes, standards and the regulatory and advisory organizations that influence fire department operations.
- analyze the role of the company in area-wide emergencies.
- describe the roles and responsibilities of the fire department in routine inspections.
- describe proper care of department property and records.
- compare and contrast methods for determining station location.
- determine manning requirements, based on ISO and local factors.
FT 170 Fire Investigation

This course focuses on determining causes of fires (accidental, suspicious and incendiary), the types of fires, related laws, an introduction to arson and incendiaryism, recognizing and preserving evidence, the interviewing of witnesses and suspects, arrest and detention procedures, court procedures and giving court testimony.

Student Learning Outcomes

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

- SLO 1: Comprehend laws, regulations, codes, standards and the regulatory and advisory organizations that influence fire department operations.
- describe the proper arrest and detention procedures for adults and juveniles.
- SLO 2: Analyze and determine the causes of fire, extinguishing agents, states of fire, fire development, and method of heat transfer.
- diagnose the point of origin at a fire scene
- recognize, protect, and preserve evidence of fire cause; in proper techniques relating to court testimony; in proper techniques for interviewing witnesses and suspects; in laws relating to fire investigation.
- relate the responsibilities of determining the cause of fire to fire and police personnel.
- describe the scientific method of fire investigation

FT 180 Rescue Practices

This course focuses on the identification and management of rescue situations, such as proper utilization and awareness of equipment, tools, and techniques to handle various rescue situations. Topics include vehicle extrication, water rescue, vertical rescue, building collapse, radiation hazards, hazardous materials rescue, fire situations including rapid intervention awareness, and other emergency situations.
FT 190 Fire Tactics and Strategy

This course provides the study of fundamental principles of fire tactics and strategy under fireground conditions and procedures for effective development and application of pre-fire plans. Fire emergency problems are critically analyzed and definitive coping strategies are examined as it relates to staffing resources, equipment and extinguishing agents available during the emergency incident. This course meets the National Fire Academy, Fire and Emergency Services Higher Education (FESHE) curriculum model for the Strategy and Tactics Course. This course is also aligned with the State of California Fire Marshal "All Risk Command for Company Officers" (2D) certification track series.

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

- SLO 1: Comprehend the qualifications for entry level skills, the discipline and evaluation process, fire service structure, history, and culture for the field of fire technology.
- explain the primary functions of engine and truck companies.
• describe methods for dealing with the personal stress accompanies fire command.
• SLO 2: Comprehend laws, regulations, codes, standards and the regulatory and advisory organizations that influence fire department operations.
• describe the goal of the nation's fire service.
• identify common fireground safety practices, safety violations, and fire fighter injury rates.
• SLO 3: Analyze, appraise, and evaluate fire incidents and components of emergency management and fire fighter safety.
• identify the essential data that should be gathered and recorded on pre-fire plans.
• define "size-up" and describe the factors of size-up, which must be considered for control of an emergency situation.
• identify and describe the seven strategic and tactical priorities.
• describe tactical plans for rescue, exposure protection, confinement, extinguishments, overhaul, ventilation, and salvage.
• identify the factors to consider when writing a report of conditions at an emergency scene.
• describe the role and responsibilities of first-in officer at the scene of an emergency.
• SLO 4: Analyze and determine the causes of fire, extinguishing agents, stages of fire, fire development, and methods of heat transfer.
• identify the four components of the fire Tetrahedron and their relationship to the combustion process.
• compare the four classes of fire and the process of fire behavior and growth.
• identify the four levels of emergencies and provide examples.
• identify the four leading causes of fire.
• identify methods of heat transfer and describe fire spread within structures.
• describe special circumstances to be considered in fireground operations.
• SLO 5: Synthesize and determine the appropriate use and flow requirement of hydraulic fire apparatus.
• describe and compare the general methods of water application to fireground situation and the manpower requirements necessary to deploy hose lines and develop fire streams.
• determine the manpower requirements necessary to deploy hose lines and develop fire streams.
• SLO 6: Describe the appropriate uses and maintenance for apparatus and equipment used in the fire service.
• identify the six categories of extinguishing agents and provide examples of each.
• compare the effectiveness of extinguishing agent type on the four classifications of fuel.
• discuss the four variable factors that may affect basic positioning of apparatus in an emergency.
• SLO 7: Evaluate the common types of building construction and conditions associated with structural collapse and firefighter safety.
• describe firefighting hazards and conditions associated with: remodeled structures, balloon construction, arch truss roofs, light weight construction, and poke-through construction.
evaluate the risks associated with discovering remodeled work done without appropriate local permitting.

- identify the roles of the National Incident Management System (NIMS) and Incident Management System (ICS) as it relates to strategy and tactics;

- demonstrate the various roles and responsibilities in ICS/NIMS

FT 210 Firefighter Academy for the Internship Program

<table>
<thead>
<tr>
<th>Units:</th>
<th>7.5</th>
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<tbody>
<tr>
<td>Hours:</td>
<td>90 hours LEC; 135 hours LAB</td>
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</table>

**Prerequisite:**

FT 300 with a grade of "C" or better; Current EMT Certification in the State of California. BLS Provider or BLS for the Healthcare Provider from American Heart Association; or current American Red Cross CPR for Professional Rescuer). CPR must stay current for the entire internship. The student must meet other Academy requirements including but not limited to; drug screening, background check, purchasing firefighting personal protective equipment, college GPA of 2.5, physical, physical ability test, respirator fit testing, and a valid driver's license, current Candidate Physical Ability Test (CPAT) card. The students applying for FT 210 must pass a fire interview board to be accepted into the course.

**Corequisite:**

FT 498

**Enrollment Limitation:**

All students must be enrolled in FT 498 to sign up for FT 210.

**Catalog Date:**

June 1, 2019

FT 210 is a Firefighter Academy to provide the techniques and skills to work effectively and safely within the fire environment as well as in the fire department. This Firefighter Academy is CSD Fire Department's Academy (NOT a State Certified Regional Fire Academy). Students that successfully complete this course along with the CSD/CRC Firefighter work experience program (FT 498) are allowed to apply for the State of California Fire Fighter I certification. Topics include indoctrination into the fire service, general maintenance, apparatus and equipment operations, fire control, salvage, fire prevention and public education, fire and arson investigation, rapid intervention crew tactics, physical fitness/wellness, emergency care, and forcible entry. Students may be charged a lab fee for personal protective equipment (PPE) in the use of and maintenance of structural firefighter turnouts and equipment in this course. Students will also be responsible for purchasing other equipment, liability insurance and uniforms. Pass/no pass only.

### Student Learning Outcomes

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

- **SLO #1:** Understand the core values of the fire service and the duty to provide service to the public.
- Describe the history, development, structure, organization, and responsibility of the fire service.
- Demonstrate basic skills in public education procedures and instruction.
- Understand and performs preventative maintenance to fire station, apparatus, and equipment.
- Explain and apply the basic concept of fire control, fire and arson investigation, and fire communication systems.
- SLO #2: Understand and apply national standards to firefighting techniques and operations.
- Use fire department apparatus and tools within the scope of assignment.
- Identify and demonstrate first responder responsibilities for handling medical emergencies.
- Demonstrate firefighter rescue and survival skills.
- Demonstrate fire suppression tactics and strategies.
- SLO #3: Demonstrate professional values and standards for fire service personnel that the industry requires
- Apply workplace rules and laws regarding harassment/discrimination policies and mandated reporting procedures.
- Comprehend the need to maintain both physical and mental health fitness to work in the field of Fire Service.

FT 295 Independent Studies in Fire Technology

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<th>Units:</th>
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<tr>
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<td>Prerequisite:</td>
<td>None.</td>
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</tbody>
</table>

An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of "Special Studies" for full details of Independent Studies.

Student Learning Outcomes

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

- SLO #1: Actively engage in intellectual inquiry beyond that required in order to pass a course of study (College Wide Learning Outcome – Area 4).
- Discuss and outline a proposal of study (that can be accomplished within one semester term) with a supervising instructor qualified within the discipline.
- Design an independent study (to be completed individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
- Use information resources to gather discipline-specific information.
- SLO #2: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in the major discipline of study to significant problems and/or educational activities (College Wide Learning Outcome – Area 3).
- Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in the major discipline of study.
FT 300 Fire Protection Organization

This course provides an introduction to fire protection and emergency services. Fire Protection Organization is recommended as the first course in the series of fire technology courses. Topics covered include: career opportunities in fire protection and related fields; culture and history of emergency services; philosophy and history of fire protection; fire loss analysis; organization and function of public and private fire protection services; fire departments as part of local government; laws and regulations affecting the fire service; fire service nomenclature; specific fire protection functions; basic fire chemistry and physics; an introduction to fire protection systems; and an introduction to fire strategy and tactics; life safety initiatives. This course meets the National Fire Academy, Fire and Emergency Services Higher Education (FESHE) curriculum model for the Principles of Emergency Services.

Student Learning Outcomes

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

- SLO 1: Comprehend the qualifications for entry level skills, the discipline and evaluation process, fire service structure, history, and culture for the field of the fire service.

- analyze and describe the differences between the certificate, two-year, four-year degree programs and state certification.

- define the educational requirements, duties and information sources for various occupations in fire protection and explain the value of higher education to the professionalization of the fire service

- SLO 2: Comprehend laws, regulations, codes, standards and the regulatory and advisory organizations that influence fire department and emergency operations.

- list and describe the major organizations that provide emergency response service and illustrate how they interrelate.
• describe the effects of fire on the environment and the historical efforts made to protect society.

• identify the major organizations that contribute to fire protection.

• define and describe the scope, purpose, and organizational structure of fire and emergency services.

• identify the various codes, standards, ordinances and regulations that affect fire protection.

• Identify the primary responsibilities of fire prevention personnel including, code enforcement, public information, and public and private protection systems.

• SLO 3: Analyze the basic components of fire; determine the causes of fire, extinguishing agents, stages of fire, fire development, and method of heat transfer.

• describe firefighting strategy and tactics.

• demonstrate the basic elements of firefighting safety and survival.

• SLO 4: Describe the common types of fire and emergency service facilities, equipment, and apparatus along with its appropriate uses and maintenance.

• summarize the basic components of fire as a chemical reaction, the major phases of fire and examine the main factors that influence fire spread and fire behavior.

• examine the types of common fire department apparatus, equipment and personal safety equipment used for firefighting.

• identify the various applications of computers in the fire service.

• SLO 5: Define command structure utilized at all fire and emergency incidents.

• define the role of national, State and local support organizations in the fire and emergency services

• compare and contrast effective management concepts for various emergency situations

• SLO 6: Recognize the components of career preparation and goal setting.

• identify fire protection and emergency-service careers in both the public and private sector

• describe the importance of wellness and fitness as it relates to all fire and emergency services

• demonstrate a working knowledge of basic culinary etiquette appropriate for shift work

FT 301 Fire Prevention Technology

| Units: | 3 |
| Hours: | 54 hours LEC |
| Prerequisite: | None. |
| Advisory: | FT 300 |
| Transferable: | CSU |
| Catalog Date: | June 1, 2019 |
This course provides fundamental knowledge relating to the field of fire prevention, history and philosophy of fire prevention, organization and operation of a fire prevention bureau, use and application of codes and standards, plans review, fire inspection practices with identification and correction of fire hazards, fire and life safety education, and fire investigation. This course meets the National Fire Academy, Fire and Emergency Services Higher Education (FESHE) curriculum model for Fire Prevention.

### Student Learning Outcomes

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

- **SLO 1**: Comprehend the qualifications for entry level skills, the discipline and evaluation process, fire service structure, history, philosophy of fire prevention.

- define the national fire problem and role of fire prevention, its origin and history within the United States.

- define all functions of a fire prevention bureau and explain the basic fire prevention functions of a fire department.

- describe inspection practices and procedures and list opportunities in professional development for fire prevention personnel.

- identify fire prevention organizations and associations.

- Identify and describe the standards for professional qualifications for Fire Marshal, Plans Examiner, Fire Inspector, Fire and Life Safety Educator, and Fire Investigator.

- **SLO 2**: Analyze, appraise, and evaluate fire incidents and components of emergency management and fire fighter safety.

- summarize the relationship between fire safety education and fire prevention.

- describe the importance of report preparation and records management in fire prevention efforts.

- identify the responsibility and authority for fire prevention inspections and related activities.

- **SLO 3**: Comprehend laws, regulations, codes, standards and the regulatory and advisory organizations that influence fire department operations.

- identify the plan review function of a fire prevention bureau.

- define laws, rules, regulations, and codes and identify those relevant to fire prevention of the authority having jurisdiction.

- **SLO 4**: Analyze and determine the causes of fire, extinguishing agents, stages of fire, fire development, and methods of heat transfer.

- identify hazards of use, storage and transfer of flammable liquids and gases and other hazardous materials.

- identify basic electrical fire hazards.

- identify the responsibility and authority for fire prevention inspections and related activities.

- **SLO 5**: Evaluate fire detection and fire suppression systems.

- identify principles and procedures used to correct fire hazards.

- define operational deficiencies in sprinkler systems and special fixed fire protection systems.
• define operating deficiencies of standpipe systems.
• define operational deficiencies of detection alarm systems.
• identify principles of fire cause determination as they relate to fire prevention and fire investigation.
• define basic principles of fire cause determination as they relate to fire prevention and fire investigation.
• SLO 6: Evaluate the common types of building construction and conditions associated with structural collapse and firefighter safety.
• identify occupancies and building construction types.
• define basic exiting requirements.

**FT 302 Fire Protection Equipment and Systems**

<table>
<thead>
<tr>
<th>Units:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Hours:</td>
<td>54 hours LEC</td>
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<td>Prerequisite:</td>
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<tr>
<td>Advisory:</td>
<td>FT 300 with a grade of &quot;C&quot; or better</td>
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<tr>
<td>Transferable:</td>
<td>CSU</td>
</tr>
<tr>
<td>Catalog Date:</td>
<td>June 1, 2019</td>
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</table>

This course provides information relating to the features of design and operation of fire detection and fire alarm systems, heat and smoke control systems, water-based fire suppression systems, special hazard fire suppression systems, fire protection and sprinkler systems, water supply for fire protection, as well as portable fire extinguishers. This course meets the National Fire Academy, Fire and Emergency Services Higher Education (FESHE) curriculum model for Fire Protection Systems.

**Student Learning Outcomes**

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

• SLO 1: Comprehend laws, regulations, codes, standards, and the regulatory and advisory organizations that influence fire department operations at the national, state, and local level.
• identify and describe various types and uses of fire protection systems.
• explain the basic components of a fire alarm system
• identify the different types of detectors and explain how they detect fire
• discuss the appropriate application of fire protection systems
• SLO 2: Evaluate the common types of building construction and conditions associated with structural collapse and firefighter safety.
• explain the benefits of fire protection systems in various types of structures
• compare smoke and fire movements in various types of construction and the relationship to systems and equipment.

• SLO 3: Describe the basic elements of a public water supply system as it relates to fire protection, the basic elements including sources, distribution networks, piping and hydrants

• synthesize and determine the appropriate use and flow requirement of hydraulic fire apparatus.

• calculate water supply requirements, distribution system and testing for public and private fire protection and explain why water is a commonly used extinguishing agent.

• identify the different types of non-water based fire suppression systems

• analyze the application of hydraulic theory for fire protection.

• identify the different types and components of a sprinkler, standpipe, and foam systems

• examine the components and operation of automatic and special sprinkler systems.

• examine the types of standpipe systems and water supply requirements.

• review residential and commercial sprinkler legislation

• SLO 4: Describe the appropriate uses and maintenance for apparatus and equipment used in the fire service

• explain the operation and appropriate application for the different types of portable fire protection systems

• examine types, classifications, and effectiveness ratings of fire extinguishers.

• classify distribution, installation and test requirements for fire extinguishers

• examine the types, components and operation of fire protection systems and equipment for special hazards.

• compare detection, alarm and supervisory devices and systems.

• compare heat and smoke control devices and hardware and describe the hazards of smoke

• list the four factors that can influence smoke movement in a building.

FT 303 Building Construction for Fire Protection

| Units: | 3 |
| Hours: | 54 hours LEC |
| Prerequisite: | None. |
| Advisory: | FT 300 with a grade of "C" or better |
| Transferable: | CSU |
| Catalog Date: | June 1, 2019 |
This course is the study of the components of building construction that relate to firefighter and life safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, pre-planning fire operations and operating at fires and other emergencies. The development and evolution of building and fire codes will be studied in relationship to past fires in residential, commercial and industrial occupancies. This course meets the National Fire Academy, Fire and Emergency Services Higher Education (FESHE) curriculum model for Building Construction for Fire Prevention.

### Student Learning Outcomes

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

- **SLO 1:** Analyze, appraise, and evaluate fire incidents and components of emergency management and firefighter safety.
  - analyze safety concerns presented by the following loads: designed, wind, snow, concentrated, distributed, dead, alive, fire, static, impact, suspended, axial, eccentric and torsional.
  - apply consequences of fire exposure on compressive or tensile members composed of common building materials.

- **SLO 2:** Identify various classifications of building construction and understand theoretical concepts of how fire impacts major types of building construction
  - evaluate the common types of building construction and conditions associated with structural collapse and firefighter safety.
  - evaluate fire stability for the following structural members: column, wall, arch, beam, truss.
  - define the key factors in fire performance of three common floors and four ceilings commonly found in wood and ordinary construction.
  - identify the key features of a wood frame building and their implications for fire stability.
  - identify the function of each principal structural component in typical building design
  - explain the different loads and stresses that are placed on a building and their interrelationships
  - describe building construction as it relates to firefighter safety, building codes, fire prevention, code inspection, firefighting strategy and tactics
  - classify major types of building construction in accordance with a local/model building code
  - define ordinary construction and factors in fire stability and fire spread.
  - analyze the hazards and tactical considerations associated with the various types of building construction along with indicators of collapse in ordinary construction.
  - apply the probable fire reaction of alterations, additions, vernacular construction, or faulty construction detection systems, and spatial characteristics.
  - identify key factors that may be expected to lessen or increase the resistance of steel to stress and fire.
  - differentiate between fire resistance, flame spread, and describe the testing procedures used to establish ratings for each
  - identify key factors that increase or lessen concrete's resistance to stress and fire.
- evaluate the implications for fire growth in modern building design by applying basic principles of fire growth analysis.
- identify fire concerns related to interior finish.
- evaluate the probable impact of the following factors on smoke spread within buildings, buoyancy, expansion, stack effect, wind, HVAC, smoke control systems, fire protection systems, detection systems, and spatial characteristics.
- analyze features that may adversely affect effectiveness of safety of emergency operations in buildings under construction.
- classify occupancy designations of the building code
- identify the indicators of potential structural failure as they relate to firefighter safety
- identify the role of GIS as it relates to building construction

**FT 304 Fire Behavior and Combustion**

<table>
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<th>Units:</th>
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<tbody>
<tr>
<td>Hours:</td>
<td>54 hours LEC</td>
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<tr>
<td>Prerequisite:</td>
<td>None.</td>
</tr>
<tr>
<td>Advisory:</td>
<td>FT 300 with a grade of &quot;C&quot; or better</td>
</tr>
<tr>
<td>Transferable:</td>
<td>CSU</td>
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<tr>
<td>Catalog Date:</td>
<td>June 1, 2019</td>
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</tbody>
</table>

This course provides the student with theories and fundamentals of how and why fires start, spread and are controlled; an in-depth study of fire chemistry and physics, fire characteristics of materials, extinguishing agents and fire control techniques. This course meets the National Fire Academy, Fire and Emergency Services Higher Education (FESHE) curriculum model for Fire Behavior and Combustion.

**Student Learning Outcomes**

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

- SLO 1: Analyze, appraise, and evaluate fire incidents and components of emergency management and fire fighter safety.
- identify the fundamental theories of fire behavior and combustion
- explain the basic laws differentiating matter and energy.
- identify physical properties of the three states of matter
- SLO 2: Comprehend laws, regulations, codes, standards and the regulatory and advisory organizations that influence fire department operations.
- describe the Department of Transportation warning placards and labeling systems.
- define the Department of Transportation Hazard Class System
- SLO 3: Analyze and determine the causes of fire, extinguishing agents, stages of fire, fire development, and methods of heat transfer.
- define basic terminology, definitions and terms associated with basic fire chemistry and the dynamics of fire
- categorize the components of fire
- examine some of the basic chemical symbols used in chemical formula writing.
- explain the importance of the various physical properties of the three physical states of matter as it relates to the process of burning
- examine how physical forces caused by fire can affect the changes in the physical states of matter.
- discuss various materials and their relationship to fires as fuel
- SLO 4: Describe the appropriate uses and maintenance for apparatus and equipment used in the fire service.
- demonstrate knowledge of the characteristics of water as a fire suppression agent
- differentiate the various types of extinguishing agents and identify various methods and techniques to the theory of fire extinguishment.
- articulate other suppression agents and strategies

FT 305 Firefighter Safety and Survival

| Units:     | 3 |
| Hours:     | 54 hours LEC |
| Prerequisite: | None. |
| Advisory:  | FT 300 |
| Transferable: | CSU |
| Catalog Date: | June 1, 2019 |

The course introduces the principles and history related to the national firefighter life safety initiatives, focusing on the need for cultural and behavioral changes throughout the emergency services profession. Emphasis is placed on occupational health and safety of firefighters as well as their personal and organizational accountability. Topics include safety, risk management, medical and fitness standards, industry standards relating to vehicle operation and road scene safety as well as firefighter fatality case studies and analysis. The course emphasizes best safety practices before, during, and after the emergency incident. This course meets the National Fire Academy, Fire and Emergency Services Higher Education (FESHE) curriculum model for Principles of Fire and Emergency Services Safety and Survival.

Student Learning Outcomes

Upon completion of this course, the student will be able to:
- SLO #1: Define and describe the need for cultural and behavioral change within the emergency services relating to safety, incorporating leadership, supervision, accountability and personal responsibility.
- explain the need for enhancements of personal and organizational accountability for health and safety.
- define how the concepts of risk management affect strategic and tactical decision-making.
- SLO #2: Describe and evaluate circumstances that might constitute an unsafe act.
- explain the concept of empowering all emergency services personnel to stop unsafe acts.
- SLO #3: Validate the need for national training standards as they correlate to professional development inclusive of qualifications, certifications, and re-certifications.
- defend the need for annual medical evaluations and the establishment of physical fitness criteria for emergency services personnel throughout their careers.
- explain the vital role of local departments in national research and data collection systems.
- illustrate how technological advancements can produce higher levels of emergency services safety and survival.
- explain the importance of investigating all near-misses, injuries and fatalities.
- SLO #4: Discuss how incorporating the lessons learned from investigations can support cultural change throughout the emergency services.
- describe how obtaining grants can support safety and survival initiatives.
- formulate an awareness of how adopting standardized policies for responding to emergency scenes can minimize near-misses, injuries and deaths.
- SLO #5: Explain how the increase in violent incidents impacts safety for emergency services personnel when responding to emergency scenes.
- recognize the need for counseling and psychological support for emergency services personnel, their families, as well as, identify access to local resources and services.
- describe the importance of public education as a critical component of life safety programs.
- discuss the importance of fire sprinklers and code enforcement.
- explain the importance of safety in the design of apparatus and equipment.

**FT 320 Hazardous Materials**

| Units: | 3 |
| Hours: | 54 hours LEC |
| Prerequisite: | None. |
| Advisory: | FT 300, 301, 302, 303, and 304 |
| Transferable: | CSU |
| Catalog Date: | June 1, 2019 |
This course provides a study of the fire fighting practices related to hazardous chemicals, including their physical properties, uses in industry, and characteristics when involved in spills, fires, and accidents. Basic information regarding health effects and treatment, and fire department protocols and responsibilities.

Student Learning Outcomes

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

- **SLO 1:** Analyze, appraise, and evaluate fire incidents and components of emergency management and fire fighter safety.
- evaluate the various Dept. of Transportation Hazard classes.
- evaluate the United Nations Placarding and Labeling System.
- examine the basic physical properties and burning characteristics of the various classes of hazardous materials.
- **SLO 2:** Comprehend laws, regulations, codes, standards, and the regulatory and advisory organizations that influence fire department operations.
- compare the safety considerations encumbered by the fire department to ensure compliance with State and Federal guidelines.
- describe the legislature and legal authority controlling the actions of all activities conducted on scene by all agencies involved.
- **SLO 3:** Analyze and determine the causes of fire, extinguishing agents, stages of fire, fire development, and methods of heat transfer.
- explain the need for scene isolation, scene stabilization, and incident control.
- compare various acceptable methods of incident control measures depending upon the dangers of the chemicals.
- describe the importance of evacuation, noncommitment by the fire department, and total withdrawal procedures.
- analyze the effects of such modifying conditions as wind, temperature, and other weather and terrain-related factors in dealing with a hazardous material spill.
- explain the health dangers of chemical classes, and describe their resultant symptoms during physical human contact.
- **SLO 4:** Evaluate fire detection and fire suppression systems.
- analyze hazardous materials emergency case studies and develop management procedures and plans.

FT 495 Independent Studies in Fire Technology
An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of “Special Studies” for full details of Independent Studies.

### Student Learning Outcomes

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

- **SLO #1:** Actively engage in intellectual inquiry beyond that required in order to pass a course of study (College Wide Learning Outcome – Area 4).
- **SLO #2:** Discuss and outline a proposal of study (that can be accomplished within one semester term) with a supervising instructor qualified within the discipline.
- **SLO #3:** Design an independent study (to be completed individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
- **SLO #4:** Use information resources to gather discipline-specific information.
- **SLO #5:** SLO #2: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in the major discipline of study to significant problems and/or educational activities (College Wide Learning Outcome – Area 3).
- **SLO #6:** Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in the major discipline of study.
- **SLO #7:** Explain the importance of the major discipline of study in the broader picture of society.
- **SLO #8:** SLO #3: Communicate a complex understanding of content matter of the major discipline of study (College Wide Outcome – Area 3).
- **SLO #9:** Demonstrate competence in the skills essential to mastery of the major discipline of study that are necessary to accomplish the independent study.
- **SLO #10:** SLO #4: Identify personal goals and pursue these goals effectively (College Wide Outcome – Area 4).
- **SLO #11:** Utilize skills from the “academic tool kit” including time management, study skills, etc., to accomplish the independent study within one semester term.

### FT 498 Work Experience in Fire Technology

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<tr>
<th>Units:</th>
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<tbody>
<tr>
<td>Hours:</td>
<td>54 - 162 hours LAB</td>
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<tr>
<td>Prerequisite:</td>
<td>None.</td>
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<tr>
<td>Transferable:</td>
<td>CSU</td>
</tr>
<tr>
<td>Catalog Date:</td>
<td>June 1, 2019</td>
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</table>
This course provides students with opportunities to develop marketable skills in preparation for employment in their major field of study or advancement within their career. It is designed for students interested in work experience and/or internships in transfer level degree occupational programs. Course content includes understanding the application of education to the workforce; completion of required forms which document the student's progress and hours spent at the work site; and developing workplace skills and competencies. Appropriate level learning objectives are established by the student and the employer. During the semester, the student is required to participate in a weekly orientation and 75 hours of related paid work experience, or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. Work Experience may be taken for a total of 16 units when there are new or expanded learning objectives. Only one Work Experience course may be taken per semester.

**Student Learning Outcomes**

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

- **DEMONSTRATE AN UNDERSTANDING AND APPLICATION OF PROFESSIONAL WORKPLACE BEHAVIOR IN A FIELD OF STUDY RELATED ONE’S CAREER.** (SLO 1)
  - Understand the effects time, stress, and organizational management have on performance.
  - Demonstrate an understanding of consistently practicing ethics and confidentiality in a workplace.
  - Examine the career/life planning process and relate its relevancy to the student.
  - Demonstrate an understanding of basic communication tools and their appropriate use.
  - Demonstrate an understanding of workplace etiquette.

- **DESCRIBE THE CAREER/LIFE PLANNING PROCESS AND RELATE ITS RELEVANCY TO ONE’S CAREER.** (SLO 2)
  - Link personal goals to long term achievement.
  - Display an understanding of creating a professional first impression.
  - Understand how networking is a powerful job search tool.
  - Understand necessary elements of a résumé.
  - Understand the importance of interview preparation.
  - Identify how continual learning increases career success.

- **DEMONSTRATE APPLICATION OF INDUSTRY KNOWLEDGE AND THEORETICAL CONCEPTS AS WRITTEN IN LEARNING OBJECTIVES IN PARTNERSHIP WITH THE EMPLOYER WORK SITE SUPERVISOR.** (SLO 3)
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