



U.S. Fire Administration
Working for a fire-safe America

National Fire Academy FESHE Model Curriculum

Reviewed May 2019



FEMA

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Mission Statement

We support and strengthen fire and emergency medical services and stakeholders to prepare for, prevent, mitigate and respond to all hazards.



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Working for a fire-safe America

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Associate's (Core)

Principles of Emergency Services (C0273)

Course description

This course provides an overview to fire protection and emergency services, career opportunities in fire protection and related fields, culture and history of emergency services, 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, introduction to fire protection systems, introduction to fire strategy and tactics, and life safety initiatives.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Illustrate the history of the fire service.
 - a. Illustrate and explain the history.
 - b. Evaluate the culture of the fire service.
 - c. Analyze the basic components of fire as a chemical chain reaction, as well as the major phases of fire.
 - d. Examine the main factors that influence fire spread and fire behavior.
2. Compare and contrast the components and development of the fire and emergency services.
 - a. List and describe the major organizations that provide emergency response service, and illustrate how they interrelate.
 - b. Explain the scope, purpose and organizational structure of fire and emergency services.
 - c. Differentiate between fire service training and education.
 - d. Explain the value of higher education to the professionalization of the fire service.
 - e. Define the role of national, state and local support organizations in fire and emergency services.
 - f. Describe the common types of fire and emergency service facilities, equipment and apparatus.
 - g. Compare and contrast effective management concepts for various emergency situations.

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3. Analyze careers in fire and emergency services.
 - a. Identify fire protection and emergency service careers in both the public and private sector.
 - b. Explain the primary responsibilities of fire prevention personnel, including code enforcement, public information, and public and private protection systems.
 - c. Develop the components of career preparation and goal setting.
 - d. Demonstrate the importance of wellness and fitness as it relates to emergency services.

Available texts

Klinoff, R. (2021). *Introduction to fire protection and emergency services* (6th ed.). Jones & Bartlett Learning. ISBN: 9781284180152. <https://www.psglearning.com/fire/science/productdetails/9781284180152>

Loyd, J. B., & Richardson, J. D. (2013). *Fundamentals of fire and emergency services* (2nd ed.). Pearson. ISBN-10: 0-13341923-1, ISBN-13: 978-0-13-341923-8. <http://www.bradybooks.com/store/product.aspx?isbn=0133419231>

Supporting references/research for faculty and students

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

International Fire Service Training Association. (2015). *Fire and emergency services orientation and terminology* (6th ed.). Fire Protection Publications. ISBN: 978-0-87939-592-6. <https://www.ifsta.org/shop/fire-and-emergency-services-orientation-and-terminology-6th-edition/36490>

U.S. Fire Administration (USFA) publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous Materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <https://www.usfa.fema.gov/statistics/reports/>

National Emergency Training Center (NETC) Library: <https://www.usfa.fema.gov/library/>

National Institute of Standards and Technology (NIST): <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hsdl.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

Additional references

- Federal Emergency Management Agency - Emergency Management Institute (EMI) Course | IS-200.C: Basic Incident Command System for Initial Response. (2019). Training.fema.gov. Retrieved 19 January 2017, from <https://training.fema.gov/is/courseoverview.aspx?code=IS-200.c>
- Federal Emergency Management Agency - Emergency Management Institute (EMI) Course | IS-100.C: Introduction to the Incident Command System, ICS100. (2019). Training.fema.gov. Retrieved 19 January 2017, from <https://training.fema.gov/is/courseoverview.aspx?code=IS-100.c>
- Federal Emergency Management Agency - Emergency Management Institute (EMI) Course | IS-700.B: An Introduction to the National Incident Management System. (2018). Training.fema.gov. Retrieved 19 January 2017, from <https://training.fema.gov/is/courseoverview.aspx?code=IS-700.b>
- International Fire Service Training Association. (2011). *Fire and emergency services orientation and terminology* (5th ed.). Fire Protection Publications.
- Lepore, P. S. (2003). *SMOKE your firefighter interview* (1st ed.). Freespool Publications.
- Smith, J, & Newton, P. (2002). *Strategic and tactical considerations on the fireground* (1st ed.). Trafford.

Course outline

- I. Careers in the Fire Protection/Emergency Services.
 - A. Opportunities/Private, Industrial, Local, Municipal, State and Federal.
 - B. Pay, Hours of Duty, Benefits, Promotion and Retirement Qualifications.
 - C. Work Ethics and Human Relations Education and Training.
 1. Certificates.
 2. Degrees.
 3. Selection Process.
- II. History.
 - A. Evolution of the Fire Protection.
 - B. The U.S. Fire Problem: Life and Property.
- III. Fire Prevention and Public Fire Education.
 - A. Fire Investigation.
 - B. Code Enforcement.
 - C. Public Education.
- IV. Scientific Terminology.
 - A. Fire Behavior.
 - B. Flammability and Characteristics of Solids, Liquids and Gases.
- V. Building Design and Construction.

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- VI. Fire Detection and Suppression Systems.
 - VII. The Role of Public and Private Support Organizations.
 - A. Local.
 - B. State.
 - C. Federal and National.
 - D. International.
 - VIII. Fire and Emergency Services Equipment and Facilities Management.
 - A. Emergency Operations.
 - B. Organizational Structure of Fire and Emergency Services.

Building Construction for Fire Protection (C0275)

Course description

This course provides the components of building construction related to firefighter and life safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, preplanning fire operations and operating at emergencies.

Prerequisites

Completion of Principles of Emergency Services (C0273) or instructor approval.

Course outcomes

Upon completion of this course, you will be able to:

1. Describe building construction as it relates to firefighter safety, buildings codes, fire prevention, code inspection, firefighting strategy, and tactics.
2. Classify major types of building construction in accordance with a local/model building code.
3. Analyze the hazards and tactical considerations associated with the various types of building construction.
4. Explain the different loads and stresses that are placed on a building and their interrelationships.
5. Identify the function of each principal structural component in typical building design.
6. Differentiate between fire resistance and flame spread, and describe the testing procedures used to establish ratings for each.
7. Classify occupancy designations of the building code.
8. Identify the indicators of potential structural failure as they relate to firefighter safety.
9. Identify the role of a geographic information system (GIS) as it relates to building construction.

Course objectives

Upon completion of this course, you will be able to:

1. Identify various classifications of building construction.
2. Understand theoretical concepts of how fire impacts major types of building construction.

Available texts

Corbett, G. P., & Brannigan, F. L. (2021). *Brannigan's building construction for the fire service* (6th ed.). Jones & Bartlett Learning. Enhanced ISBN: 9781284177312. <https://www.psglearning.com/fire/science/productdetails/9781284177312>

International Fire Service Training Association. (2016). *Building construction related to the fire service* (4th ed.). Fire Protection Publications. ISBN: 978-0-87939-5940. https://www.ifsta.org/shop/search?search_block_form=building+construction+related+to+the+fire+service%2C+4th

Schwinge, C. (2017). *Knowing your buildings: A firefighter's reference guide* (2nd ed.). PennWell Books. ISBN: 9781593703257. <http://www.PennWellbooks.com/shop-fire-books-videos/new-products/knowning-your-buildings-a-firefighters-reference-guide-2nd-edition/>

Smith, M. (2012). *Building construction: Methods and materials for the fire service* (2nd ed.). Pearson. ISBN-10: 0-13-283007-8; ISBN-13: 978-0-13-283007-2. <http://www.bradybooks.com/store/product.aspx?isbn=0132830078>

Supporting references/research for faculty and students

Smith, J., & Newton, P. (2002). *Strategic and tactical considerations on the fireground* (1st ed.). Trafford.

Society of Fire Protection Engineers (SFPE): <https://www.sfpe.org/>

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous materials, Health and Safety, Wildfires.)

Applied research: Agency research: <https://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <https://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

🔗 <http://firefighternearmiss.com/>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Introduction.
 - A. History of Building Construction.
 - B. Governmental Functions, Building and Fire Codes.
 - C. Fire Risks and Fire Protection.
 - D. Fire Loss Management and Life Safety.
 - E. Pre-Fire Planning and Fire Suppression Strategies.
- II. Principles of Construction.
 - A. Terminology and Definitions.
 - B. Building and Occupancy Classifications.
 - C. Characteristics of Building Materials.

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- D. Types and Characteristics of Fire Loads.
 - E. Effects of Energy Conservation.
- III. Building Construction.
- A. Structural Members.
 - 1. Definitions, Descriptions and Carrying Capacities.
 - 2. Effects of Loads.
 - B. Structural Design and Construction Methods.
 - C. System Failures.
- IV. Principles of Fire Resistance.
- A. Standards of Construction.
 - B. Fire Intensity and Duration.
 - C. Theory Versus Reality.
- V. Fire Behavior Versus Building Construction.
- A. Flame Spread.
 - B. Smoke and Fire Containment.
 - 1. Construction and Suppression Systems.
 - 2. HVAC Systems.
 - 3. Rack Storage.
 - 4. Combustible.
- VI. Wood Construction.
- A. Definition and Elements of Construction.
 - B. Types of Construction.
 - C. Fire Stopping and Fire Retardants.
 - D. Modifications/Code Compliance.
- VII. Ordinary Construction.
- A. Definitions and Elements of Construction.
 - B. Structural Stability and Fire Barriers.
 - C. Modifications/Code Compliance.
- VIII. Collapse.
- IX. Ventilation.
- X. Non-Combustible.
- XI. Steel Construction.
- A. Definitions and Elements of Construction.
 - B. Structural Stability, Fire Resistance and Fire Protection of Elements.
 - C. Modifications/Code Compliance.

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- XII. Concrete Construction.
 - A. Definitions and Elements of Construction.
 - B. Structural Stability and Fire Resistance.
 - C. Modifications/Code Compliance.

 - XIII. High-Rise Construction.
 - A. Early Versus Modern Construction.
 - B. Vertical and Horizontal Extension of Fire and Smoke.
 - C. Fire Protection and Suppression.
 - D. Elevators.
 - E. Atriums/Lobbies.
 - F. Modifications/Code Compliance.

 - XIV. Collapse.

 - XV. Ventilation.

Fire Behavior and Combustion (C0276)

Course description

This course explores the theories and fundamentals of how and why fires start, spread and are controlled.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Identify physical properties of the three states of matter.
2. Categorize the components of fire.
3. Explain the physical and chemical properties of fire.
4. Describe and apply the process of burning.
5. Define and use basic terms and concepts associated with the chemistry and dynamics of fire.
6. Explain the effect and dangers of air movement on the combustion process.
7. Discuss various materials and their relationship to fires as fuel.
8. Demonstrate knowledge of the characteristics of water as a fire suppression agent.
9. Articulate other suppression agents and strategies.
10. Compare other methods and techniques of fire extinguishments.

Course objectives

Upon completion of this course, you will be able to:

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

Available texts

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Gann, R., & Friedman, R. (2015). *Principles of fire behavior and combustion* (4th ed.). Jones & Bartlett Learning. ISBN: 9781284136111. <https://www.psglearning.com/fire/science/productdetails/9781284136111>

Gorbett, G. E., & Pharr, J. L. (2010). *Fire dynamics*. Pearson. ISBN-10: 0-13-507588-2, ISBN-13: 978-0-13-507588-3. <http://www.bradybooks.com/store/product.aspx?isbn=0135075882>

Mahoney, E. E., Rickman, T., & Wallace, G. (2008). *Fire suppression practices and procedures* (2nd ed.). Pearson. <http://www.bradybooks.com/store/product.aspx?isbn=0131517732>

Quintiere, J. G. (2008). *Principles of fire behavior* (2nd ed.). Delmar, Cengage Learning. ISBN-10: 0-13-151773-2; ISBN-13: 978-0-13-151773-8.

Shackelford, R. (2009). *Fire behavior and combustion processes*. Delmar, Cengage Learning. ISBN-10: 1-4018-8016-9; ISBN-13: 978-1-4018-8016-3.

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

🔗 <http://firefighternearmiss.com/>

References

SFPE

Current events/news

<http://www.firehouse.com/>

<http://www.fireengineering.com/>

<http://www.withthecommand.com/>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Introduction.
 - A. Matter and Energy.
 - B. The Atom and its Parts.
 - C. Chemical Symbols.
 - D. Molecules.
 - E. Energy and Work.

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- F. Forms of Energy.
 - G. Transformation of Energy.
 - H. Laws of Energy.
- II. Units of Measurements.
- A. International Systems (SI) 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.
 - 1. Flashover.
 - 2. Backdraft.
 - 3. Rollover.
 - 4. Flameover.
 - 5. Heat Flow.
 - C. Fire Plumes.

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- 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.

Principles of Fire and Emergency Services Safety & Survival (C0281)

Course description

This course introduces the basic principles and history related to the national firefighter life safety initiatives, focusing on the need for cultural and behavioral change throughout the emergency services.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

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.
2. Explain the need for enhancements of personal and organizational accountability for health and safety.
3. Define how the concepts of risk management affect strategic and tactical decision-making.
4. Describe and evaluate circumstances that might constitute an unsafe act.
5. Explain the concept of empowering all emergency services personnel to stop unsafe acts.
6. Validate the need for national training standards as they correlate to professional development inclusive of qualifications, certifications and recertifications.
7. Defend the need for annual medical evaluations and the establishment of physical fitness criteria for emergency services personnel throughout their careers.
8. Explain the vital role of local departments in national research and data collection systems.
9. Illustrate how technological advancements can produce higher levels of emergency services safety and survival.
10. Explain the importance of investigating all near-misses, injuries and fatalities.
11. Discuss how incorporating the lessons learned from investigations can support cultural change throughout the emergency services.
12. Describe how obtaining grants can support safety and survival initiatives.
13. Formulate an awareness of how adopting standardized policies for responding to emergency scenes can minimize near-misses, injuries and deaths.
14. Explain how the increase in violent incidents impacts safety for emergency services personnel when responding to emergency scenes.

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15. Recognize the need for counseling and psychological support for emergency services personnel and their families, and identify access to local resources and services.
 16. Describe the importance of public education as a critical component of life safety programs.
 17. Discuss the importance of fire sprinklers and code enforcement.
 18. Explain the importance of safety in the design of apparatus and equipment.

Course objectives

Upon completion of this course, you will be able to:

1. Identify and explain the 16 life safety initiatives.
2. Understand the concepts of risk management and mitigation as it pertains to emergency services.

Available texts

Angle, J. S. (2016). *Occupational safety and health in emergency services* (4th ed.). Jones & Bartlett Learning. ISBN: 9781284035919. <https://www.psglearning.com/catalog/productdetails/9781284035919>

Everyone Goes Home. (n.d.). *16 firefighter life safety initiatives*. <https://www.everyonegoeshome.com/16-initiatives/>

Ford, T. M. (2012). *Fire and emergency services safety and survival*. Pearson. ISBN-10: 0-13-283004-3; ISBN-13: 978-0-13-283004-1. <http://www.bradybooks.com/store/product.aspx?isbn=0132830043>

International Fire Service Training Association. (2010). *Understanding and implementing the 16 firefighter life safety initiatives*. Fire Protection Publications.

Zimmerman, D. (2021). *Fire fighter safety and survival* (3rd ed.). Jones & Bartlett Learning. ISBN: 9781284180176. <https://www.psglearning.com/fire/science/productdetails/9781284180176>

Supporting references/research for faculty and students:

Firefighter Life Safety Summit Initial Report and additional summit reports (Wildland Firefighting, Health—Wellness—Fitness, Structural Firefighting, Emergency Vehicles and Roadway Safety, Culture Change) at www.everyonegoeshome.com

International Fire Service Training Association. (2010). *Understanding and implementing the 16 firefighter life safety initiatives*. Fire Protection Publications. https://shop.ifsta.org/product_info.php/products_id/70441

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Introduction.
 - A. History of Fire Service Culture.
 - B. Organizational Culture.
 - C. Individual Role in Culture/Behavior.
 - D. History of Line of Duty Deaths and Injuries Statistics.
 - E. Defining the Nature of the Problem.
- II. The National Context, Health and Safety.
 - A. National Fire Protection Association (NFPA), Occupational Safety and Health Administration (OSHA).
 - B. Medical and Fitness Standards.
 - C. Data Collection (National Fire Incident Reporting System).
 - D. Research/Investigation (NIST, National Institute for Occupations Safety and Health (NIOSH)).
- III. Training, Equipment, Response.
 - A. Training, Certification, Credentialing.
 - B. Apparatus and Equipment.
 - C. Emergency Response — Response to Emergency Scenes.
 - D. Violent Incidents.
 - E. Emerging Technologies.
- IV. Organizational Health and Safety Profile.
 - A. Personal and Organizational Accountability.
 - B. Present Condition/Culture.
 - C. Investigations — Internal.
 - D. Analyzing your Profile.
 - E. Utilizing Grants to Meet Needs.
- V. Risk Management.
 - A. Risk Management Concepts and Practices.
 - B. Unsafe Acts.
 - C. Empowerment Definition.
- VI. Prevention.
 - A. Home Fire Sprinklers.
 - B. Code Enforcement.
 - C. Public Education/Fire and Life Safety.
 - D. Counseling and Psychological Support.

Fire Prevention (C0286)

Course description

This course provides fundamental knowledge relating to the field of fire prevention. Topics include: history and philosophy of fire prevention, organization and operation of a fire prevention bureau, use and application of codes and standards, plans review, fire inspections, fire and life safety education, and fire investigation.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Define the national fire problem and role of fire prevention.
2. Identify and describe fire prevention organizations and associations.
3. Define laws, rules, regulations and codes, and identify those relevant to fire prevention of the authority having jurisdiction.
4. Define the functions of a fire prevention bureau.
5. Describe inspection practices and procedures.
6. Identify and describe the standards for professional qualifications for Fire Marshal, Plans Examiner, Fire Inspector, Fire and Life Safety Educator, and Fire Investigator.
7. List opportunities in professional development for fire prevention personnel.
8. Describe the history and philosophy of fire prevention.

Course objectives

Upon completion of this course, you will be able to:

1. Identify laws, codes, ordinances and regulations as they relate to fire prevention.
2. Understand code enforcement as it impacts life and property loss.

Available texts

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Diamantes, D. (2016). *Principles of fire prevention* (3rd ed.). Jones & Bartlett Learning. ISBN: 9781284041866. <https://www.psglearning.com/catalog/productdetails/9781284041866>

Harrington, G. E., & Bigda, K. C. (2021). *NFPA 101: Life safety code handbook*. National Fire Protection Association. <https://catalog.nfpa.org/NFPA-101-Life-Safety-Code-Handbook-P15695.aspx>

International Fire Service Training Association. (2016). *Fire inspection and code enforcement* (8th ed.). Fire Protection Publications. ISBN: 978-0-87939-605-3. <https://www.ifsta.org/shop/fire-inspection-and-code-enforcement-8th-edition/36299>

Lacey, B., & Valentine, P. (2017). *Fire prevention applications* (2nd ed.). Fire Protection Publications. ISBN: 9780879396213. <https://www.ifsta.org/shop/fire-prevention-applications-2nd-edition/36200>

Love, M. T., & Robertson, J. C. (2015). *Robertson's introduction to fire prevention* (8th ed.). Pearson. ISBN-10: 0-13-384327-0; ISBN-13: 978-0-13-384327-9. <http://www.bradybooks.com/store/product.aspx?isbn=0133843270>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. National Fire Problem and Role of Fire Prevention.
 - A. Definition.
 - B. Historical Overview.
 - C. Data Analysis/GIS.
 - D. Current Trends of Fire Prevention.
- II. Fire Prevention Organizations and Associations.
 - A. Public — Federal, State and Local.
 - B. Private — International, National and Regional.

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- III. Laws, Rules, Regulations and Codes.
 - A. Definitions.
 - B. Applicability.
 - C. Interrelationship.
 - D. Limitations.

 - IV. Fire Prevention Bureau Functions.
 - A. Data Collection and Analysis.
 - B. Plans Review.
 - C. Fire Inspections.
 - D. Fire and Life Safety Education.
 - E. Fire Investigations.

 - V. Tools and Equipment.
 - A. Data Collection and Analysis.
 - B. Plans Review.
 - C. Fire Inspections.
 - D. Fire and Life Safety Education.
 - E. Fire Investigations.

 - VI. Roles and Responsibilities of Fire Prevention Personnel.
 - A. Data Collection and Analysis.
 - B. Code Development and Interpretation.
 - C. Training and Education.
 - D. Enforcement.
 - E. Management.

 - VII. Professional Certification.
 - A. Categories and Levels.
 - B. Local.
 - C. State.
 - D. National.

 - VIII. Professional Development.
 - A. National Fire Prevention Development Model.
 - B. Training and Education.
 - C. Certification Systems.

Fire Protection Systems (C0288)

Course description

This course provides information relating to the features of design and operation of fire alarm systems, water-based fire suppression systems, special hazard fire suppression systems, water supply for fire protection, and portable fire extinguishers.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Identify the different types, uses and benefits of fire protection systems found in various types of structures.
2. Summarize the basic elements of a public water supply system as it relates to fire protection systems.
3. Explain the operation and appropriate application for the different types of portable fire protection systems.
4. Identify the different types and components of sprinkler, standpipe and foam systems.
5. Discuss residential and commercial sprinkler legislation.
6. Compare the basic components and detectors in a fire alarm system.
7. Describe the hazards of smoke, and list the 4 factors that can influence smoke movement in a building.

Course objectives

Upon completion of this course, you will be able to:

1. Identify and describe various types and uses of fire protection systems.
2. Describe the basic elements of a public water supply system as it relates to fire protection.

Available texts

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Jones, A. M., Jr. (2021). *Fire protection systems* (3rd ed.). Jones & Bartlett Learning. ISBN: 9781284180138. <https://www.psglearning.com/fire/science/productdetails/9781284180138>

International Fire Service Training Association. (2016). *Fire protection, detection, and suppression systems* (5th ed.). Fire Protection Publications. ISBN: 978-0-87939-599-5. <https://www.ifsta.org/shop/fire-protection-detection-and-suppression-systems-5th-edition/36536>

National Fire Protection Association. (2003). *Operation of fire protection systems: A special edition of the Fire Protection Handbook*. Jones & Bartlett Learning. ISBN-10: 0877655847; ISBN-13: 9780877655848. <https://www.amazon.com/Operation-Fire-Protection-Systems-NULL/dp/0877655847>

National Training Center. (2009). *NTC brown book: Fire alarm system handbook 2018*. <https://www.amazon.com/NTC-BROWN-Brown-Systems-Design-Installation/dp/0976951142>

Supporting references/research for faculty and students

Bryan, J. L. (1993, March). *Fire suppression and detection systems* (3rd ed.). MacMillan Publishing.

Gagnon, R. (1997). *Design of water-based fire protection systems*. Delmar, Cengage Learning.

Smith, C. M., Weider, M., Brakhage, C., & International Fire Service Training Association. (2001). *Private fire protection and detection* (2nd ed.).

SFPE: <http://www.sfpe.org/>

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>
- 🔗 <http://www.homefiresprinkler.org>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Introduction to Fire Protection Systems.
 - A. The Role Fire Protection Systems Play in Protecting the Life, Safety and Welfare of the General Public and Firefighters.
 - B. Overview of the Different Types of Fire Protection Systems.
 - C. The Role of Codes and Standards in Fire Protection System Design.
- II. Water Supply Systems for Fire Protection Systems.
 - A. Sources of Fire Protection Water Supply.
 - B. Distribution Networks.
 - C. Piping.
 - D. Hydrants.
 - E. Utility Company Interface with the Fire Department.
- III. Water-Based Fire Suppression Systems.
 - A. Properties of Water.
 - 1. Water as an Effective Extinguishing Agent.
 - 2. How Water Extinguishes Fire.
 - B. Sprinkler Systems.
 - 1. Types of Systems and Applications.
 - 2. Types of Sprinklers and Applications.
 - 3. Piping, Valves, Hangers and Alarm Devices.
 - 4. Fire Department Operations in Buildings with Sprinkler Systems.
 - C. Residential Sprinkler Systems.
 - D. Standpipe Systems.
 - 1. Types and Applications.
 - 2. Fire Department Operations in Buildings with Standpipes.
 - E. Foam Systems.
 - F. Water Mist Systems.
 - G. Fire Pumps.
 - 1. Types.
 - 2. Components.
 - 3. Operation.
 - 4. Fire Pump Curves.
- IV. Non-Water-Based Fire Suppression Systems.
 - A. Carbon Dioxide Systems.
 - 1. Applications.
 - 2. Extinguishing Properties.
 - 3. System Components.
 - B. Halogenated Systems.
 - 1. Halon 1301 and the Environment.
 - 2. Halon Alternatives.
 - 3. Extinguishing Properties.
 - 4. System Components.
 - C. Dry/Wet Chemical Extinguishing Systems.
 - 1. Extinguishing Properties.
 - 2. Applications.
 - 3. UL 300.

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- V. Fire Alarm Systems.
 - A. Components.
 - B. Types of Fire Alarm Systems.
 - C. Detectors.
 - 1. Smoke.
 - 2. Heat.
 - 3. Flame.
 - D. Audible/Visual Devices.
 - E. Alarm Monitoring.
 - F. Testing and Maintenance of Fire Alarm Systems.

 - VI. Smoke Management Systems.
 - A. Hazards of Smoke.
 - B. Smoke Movement in Buildings.
 - C. Types of Smoke Management Systems.
 - D. Firefighter Operations in Buildings with Smoke Management Systems.

 - VII. Portable Fire Extinguishers.
 - A. Types and Applications.
 - B. Selection.
 - C. Placement.
 - D. Maintenance.
 - E. Portable Fire Extinguisher Operations.

Associate's (Non-Core)

Legal Aspects of Emergency Services (C0270)

Course description

This course will address the federal, state and local laws that regulate emergency services and include a review of national standards, regulations and consensus standards.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Define the different types of laws.
2. Discuss federal, state, and local laws and liabilities applicable to emergency services.
3. Explain the purpose of national codes and standards.
4. Discuss applicable court decisions that have influenced emergency services.
5. Recognize the legal issues and concerns affecting emergency services.

Course objective

Upon completion of this course, you will be able to analyze federal, state, and local laws and consensus standards as they pertain to the fire service.

Available texts

Antonellis, P. J. (2012). *Labor relations for the fire service*. PennWell Books. ISBN: 9781593702847.

Bennett, L. T. (2017). *Fire service law* (2nd ed.). Waveland Press. ISBN: 978-1-4786-3397-6.

Varone, J. C. (2014). *Legal considerations for fire & emergency services* (3rd ed.). PennWell Books. ISBN10 1-59370-347-3. <http://www.PennWellbooks.com/fire-rescue/leadership-management/legal-considerations-for-fire-emergency-services-3rd-edition/>

West, G. (2018). *Legal aspects of emergency services*. Jones & Bartlett Learning. ISBN: 9781284068276. <https://www.psglearning.com/catalog/productdetails/9781284068276>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- <https://apps.usfa.fema.gov/publications/>

References

American Bar Association (2006). *Guide to workplace law* (2nd ed.). Random House Publishing.

Garner, B. A. (2009). *Black's law dictionary* (9th ed.). West.

Hogan, L. J. (2000). *Legal aspects of the fire service* (3rd ed.). Amlex.

Quinlan, M. (n.d.). *Legal briefings for fire chiefs*. Quinlan Publishing.

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. The Legal System of the United States.
 - A. Foundations.
 - B. U.S. Constitution.
- II. Civil Versus Criminal.
 - A. Differences.
 - B. Lawsuits.
 - C. Punishments.
 - D. Burden of Proof.
- III. Tort Liability.
- IV. Negligence.
- V. Judicial System.
 - A. The Court System.
 - B. U.S. Supreme Court.
 - C. Special Courts.
 - D. Local Courts.
 - E. Penalties.

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- VI. Federal Laws and the Fire Service.
 - A. Fair Labor Standards Act.
 - B. Americans with Disabilities Act.
 - C. Age Discrimination.
 - D. Civil Rights.
 - E. Sexual Harassment.
 - VII. Employee Relations.
 - A. Physical Testing — Entrance Requirements.
 - B. Residency Requirements.
 - C. Grooming Standards.
 - D. Promotional Testing.
 - E. Psychological Examinations.
 - F. Polygraphs.
 - VIII. Fire Prevention and Fire Codes.
 - A. Fourth Amendment.
 - B. Certifications.
 - C. Building Code versus Fire Code.
 - D. Civil Versus Criminal.
 - IX. Mutual Aid.
 - X. Hazardous Materials.
 - XI. Volunteers/Contracts.
 - A. At-Will Doctrine.
 - XII. Arson.

Principles of Fire and Emergency Services Administration (C0272)

Course description

This course introduces the student to the organization and management of a fire and emergency services department and the relationship of government agencies to the fire service. Emphasis is placed on fire and emergency service ethics and leadership from the perspective of the company officer.

Prerequisites

Principles of Emergency Services.

Course outcomes

Upon completion of this course, you will be able to:

1. Acknowledge career development opportunities and strategies for success.
2. Recognize the need for effective communication skills, both written and verbal.
3. Identify and explain the concepts of span and control, effective delegation, and division of labor.
4. Select and implement the appropriate disciplinary action based upon an employee's conduct.
5. Explain the history of management and supervision methods and procedures.
6. Discuss the various levels of leadership, roles and responsibilities within the organization.
7. Describe the traits of effective versus ineffective management styles.
8. Identify the importance of ethics as it relates to fire and emergency services.
9. Identify the roles of the National Incident Management System (NIMS) and Incident Management System (IMS).

Course objectives

Upon completion of this course, you will be able to:

1. Describe the basic theories of public sector management.
2. Recognize the importance of ethics and communication skills.
3. Articulate and demonstrate the importance of the public policy process, responsibility and authority.

Available texts

Bruegman, R. R., & Lindsey, J. T. (2009). *Fire administration I*. Pearson. ISBN-10: 0-13-172084-8; ISBN-13: 978-0-13-172084-8. <http://www.bradybooks.com/store/product.aspx?isbn=0131720848>

International Fire Service Training Association. (2014). *Fire and emergency services company officer* (5th ed.). Fire Protection Publications. ISBN: 978-0-87939-564-3, <https://www.ifsta.org/shop/fire-and-emergency-services-company-officer-5th/36530>

Carter, H. R., & Rausch, E., National Fire Protection Association (2017). *Management in the fire service* (5th ed.). Jones & Barlett Learning. ISBN: 9781449690786. <https://www.psglearning.com/catalog/productdetails/9781449690786>

Smeby, L. C., Jr. (2014). *Fire and emergency services administration: Management and leadership practices* (2nd ed.). Jones & Barlett Learning. ISBN: 9781449605834. <https://www.psglearning.com/fire/science/productdetails/9781449605834>

Smoke, C. H. (2010). *Company officer* (3rd ed.). Delmar, Cengage Learning. ISBN10: 1-4354-2725-4, ISBN13: 978-1-4354-2725-9.

Ward, M. J. (2015). *Fire officer: Principles and practice* (3rd ed.). Burlington, MA: Jones & Barlett Learning. ISBN: 9781284068368.

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hsdl.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

References

Grant, N. K., & Hoover, D. H. (1994). *Fire service administration*. Jones & Bartlett Learning.

Marinucci, R. A. (2015). *The fire chief's handbook* (7th ed.). PennWell Books.

National Fire Protection Association. (2014). *Standard for fire officer professional qualifications* [Standard no. 1021]. www.nfpa.org

National Fire Protection Association. (2018). *Standard on fire department occupational safety, health, and wellness program* [Standard No. 1500]. www.nfpa.org

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. New Challenges and Opportunities.
 - A. Duties.
 - B. National Standards.
 - C. Career Opportunities.
 - D. Education and Training.
- II. Communication Process.
 - A. Verbal.
 - B. Written.
 - C. Active Listening Skills.
- III. Management Principles.
 - A. Span of Control.
 - B. Delegation/Division of Labor.
 - C. Unity of Command.
 - D. Chain of Command.
 - E. Organizational Structure.
- IV. Tools for Employee Development.
 - A. Evaluation and Appraisal of Employees.
 - B. Rewards and Motivation.
 - C. Progressive System of Discipline.
 - D. Grievance Procedures.
- V. Management and Supervision.
 - A. Theories.
 - B. History.
- VI. Managing Resources for Emergency and Non-Emergency.
 - A. Equipment.
 - B. Personnel.
 - C. Time.
- VII. Leadership.
 - A. Managers.
 - B. Leaders.
 - C. Roles and Responsibilities.
- VIII. Supervision and Management.
 - A. Styles.
 - B. Traits.
 - C. Effectiveness.

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- IX. Safety Assessment.
 - A. Non-Emergency.
 - B. Emergency.
 - X. Ethics.
 - A. Harassment.
 - B. Conflict of Interest.
 - C. Public Trust.
 - D. Code of Ethics.
 - E. Diversity.
 - F. Morality.
 - XI. Incident Management System.
 - A. Duties and Responsibilities.
 - B. Transfer of Command.
 - XII. Records Management.
 - A. Formal Documentation.
 - B. Informal Documentation.

Fire Protection Hydraulics and Water Supply (C0277)

Course description

This course provides a foundation of theoretical knowledge in order to understand the principles of the use of water in fire protection and to apply hydraulic principles to analyze and solve water supply problems.

Prerequisites

Demonstration of a competency in high school-level algebra or the equivalent.

Course outcomes

Upon completion of this unit, you will be able to:

1. Apply the application of mathematics and physics to the movement of water in fire suppression activities.
2. Identify the design principles of fire service pumping apparatus.
3. Analyze community fire flow demand criteria.
4. Demonstrate, through problem solving, a thorough understanding of the principles of forces that affect water, both at rest and in motion.
5. List and describe the various types of water distribution systems.
6. Discuss the various types of fire pumps.

Course objectives

Upon completion of this unit, you will be able to:

1. Apply water hydraulic principles.
2. Demonstrate knowledge of water hydraulics as it relates to fire protection.

Available texts

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Crapo, W. F. (2017). *Fire protection hydraulics and water supply* (3rd ed.). Jones & Bartlett Learning. ISBN: 9781284058529.

International Association of Fire Chiefs & National Fire Protection Association. (2011). *Fire apparatus driver/operator: Pump, aerial, tiller, and mobile water supply*. Jones & Bartlett Publishers. <https://www.psglearning.com/catalog/productdetails/9781284026917>

Mahoney, E., & Hannig, B. E. (2013). *Fire department hydraulics* (3rd ed.). Pearson. ISBN-10: 0-13-257715-1; ISBN-13: 978-0-13-257715-1. <http://www.bradybooks.com/store/product.aspx?isbn=9780132577151>

Richman, H., Persson, S., & National Fire Protection Association. (2008). *Engine company fireground operations* (3rd ed.). Jones & Bartlett Publishers. ISBN: 9780763744953. <https://www.psglearning.com/catalog/productdetails/9780763744953>

Richman, H. (2008). *Ladder company fireground operations* (3rd ed.). Jones & Bartlett Publishers. ISBN-13: 978-0763744960; ISBN-10: 0763744964.

Sturtevant, T. (2005). *Introduction to fire pump operations* (2nd ed.). Delmar, Cengage Learning. ISBN10: 0-7668-5452-3; ISBN13: 978-0-7668-5452-9.

Sykes, H., & Sturtevant, T. B. (2012). *Fire apparatus operator: Pumper* (3rd ed.). Delmar, Cengage Learning. ISBN10: 1-4354-3862-0; ISBN13: 978-1-4354-3862-0.

Wieder, M. (2010). *Fire service hydraulics and water supply* (2nd ed.). Fire Protection Publications. <https://www.ifsta.org/shop/hydraulics-and-water-supply-2nd-ed/36724>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: www.usfa.fema.gov/statistics/reports/

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hsd.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

References

Crapo, W. (2007). *Hydraulics for firefighting* (2nd ed.). Delmar, Cengage Learning.

Erven, L. W. (1972). *Techniques of fire hydraulics*. Glencoe Press.

International Fire Service Training Association. (2015). *Pumping apparatus driver/operator handbook* (3rd. ed.). Fire Protection Publications.

Isman, W. E. (1984). *Fire service pump operator's handbook*. PennWell Books.

Sylvia, D. (1984). *Fire service hydraulics* (2nd ed.). Edited by James F. Casey. PennWell Books.

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Water as an Extinguishing Agent.
 - A. Physical Properties.
 - B. Terms and Definitions.
- II. Math Review.
 - A. Fractions.
 - B. Ratios, Proportions and Percentage.
 - C. Powers and Roots.
- III. Water at Rest.
 - A. Basic Principles of Hydrostatics.
 1. Pressure and Force.
 2. Six Principles of Fluid Pressure.
 3. Pressure as a Function of Height and Density.
 4. Atmospheric Pressure.
 - B. Measuring Devices for Static Pressure.
- IV. Water in Motion.
 - A. Basic Principles of Hydrokinetics.
 - B. Measuring Devices for Measuring Flow.
 - C. Relationship of Discharge Velocity, Orifice Size and Flow.
- V. Water Distribution Systems.
 - A. Water Sources.
 - B. Public Water Distribution Systems.
 - C. Private Water Distribution Systems.
 - D. Friction Loss in Piping Systems.
 - E. Fire Hydrants and Flow Testing.
- VI. Fire Pumps.
 - A. Pump Theory.
 - B. Pump Classifications.
 - C. Priming Systems.
 - D. Pump Capacity.
 - E. Pump Gauges and Control Devices.
 - F. Testing Fire Pumps.
- VII. Fire Streams.
 - A. Calculating Fire Flow Requirements.
 - B. Effective Horizontal and Vertical Reach.
 - C. Appliances for Nozzles.
 - D. Performance of Smooth-Bore and Combination Nozzles.
 - E. Hand-Held Lines.
 - F. Master Streams.
 - G. Nozzle Pressures and Reaction.
 - H. Water Hammer and Cavitations.

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- VIII. Friction Loss.
 - A. Factors Affecting Friction Loss.
 - B. Maximum Efficient Flow in Fire Hose.
 - C. Calculating Friction Loss in Fire Hose.
 - D. Friction Loss in Appliances.
 - E. Reducing Friction Loss.
 - IX. Engine Pressures.
 - X. Factors Affecting Engine Pressure.
 - XI. Standpipe and Sprinkler Systems.
 - A. Standpipe Systems.
 - 1. Classifications.
 - 2. Components.
 - 3. Supplying Standpipe Systems.
 - B. Sprinkler Systems.
 - 1. Classifications.
 - 2. Components.
 - 3. Supplying Sprinkler Systems.

Occupational Safety and Health for Emergency Services (C0278)

Course description

This course introduces the basic concepts of occupational health and safety as it relates to emergency service organizations. Topics include risk and hazard evaluation and control procedures for emergency service organizations.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Describe the history of occupational health and safety.
2. Identify occupational health and safety programs for industry and emergency services today.
3. Compare the difference between standards and regulations.
4. List and describe the components of risk identification, risk evaluation and incident management.
5. Describe the relevance for safety in the workplace, including the importance of PPE.
6. Apply the knowledge of an effective safety plan to pre-incident planning, response and training activities.
7. Explain the components of an accountability system in emergency service operations.
8. Discuss the need for, and the process used for, post-incident analysis.
9. Describe the components and value of critical incident management programs.
10. Describe the responsibilities of individual responders, supervisors, Safety Officers, Incident Commanders, safety program managers, safety committees and fire department managers as they relate to health and safety programs.
11. Describe the components of a wellness/fitness plan.
12. Identify and analyze the major causes involved in line-of-duty firefighter deaths related to health, wellness, fitness and vehicle operations.

Course objectives

Upon completion of this course, you will be able to:

1. Understand the significance of occupational health and safety.
2. Describe and analyze the components of risk identification, risk evaluation and incident management.

Available texts

- Angle, J. S. (2012). *Occupational safety and health in the emergency service* (3rd ed.). Delmar, Cengage Learning. ISBN: 9781439057506.
- Bruni, J. (2012). *Occupational health and safety for the fire service*. Pearson. ISBN-10: 0-13-283005-1; ISBN-13: 978-0-13-283005-8. <http://www.bradybooks.com/store/product.aspx?isbn=0132830051>
- Dodson, D. W. (2015). *Fire department incident safety officer* (3rd ed.). Jones & Bartlett Learning. ISBN: 9781284041958.
- Foley, S. N. (2003). *Resources for fire department occupational safety and health*. Jones & Bartlett Learning. ISBN: 9780877654865. <https://www.firebooks.com/products/resources-for-fire-department-occupational-safety-and-health>
- IFSTA. (2010). *Occupational safety, health, and wellness* (3rd ed.). Fire Protection Publications. ISBN: 978-0-87939-388-5. <https://www.ifsta.org/shop/occupational-safety-health-and-wellness-3rd-ed/37212>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- ◆ NFPA 1500, 1521, 1561 and 1581.
- ◆ <https://www.hsd.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- ◆ <https://apps.usfa.fema.gov/publications/>

References

- Chikerotis, S. (2006). *Firefighters from the heart: True stories and lessons learned*. Delmar, Cengage Learning.
- Dickinson, E. V., & Wieder, M. A. (2003). *Emergency incident rehabilitation* (2nd ed.). Prentice Hall.
- Dodson, D. W. (2015). *Fire department incident safety officer* (3rd ed.). Jones & Bartlett Learning. ISBN: 9781284041958.

Kipp, J. D., & Loflin, M. E. (1996). *Emergency incident risk management: A safety & health perspective*. Wiley.

Sachs, G. M. (2001). *The fire and EMS department safety officer*. Prentice Hall.

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Introduction.
 - A. History of Occupational Safety and Health in Industry.
 - B. History of Occupational Safety and Health in Emergency Service Organizations.
 - C. Identification of Safety Problems.
 - D. Review of National Injury Statistics.
 - E. National, State and Private Organizations Involved With Occupational Safety and Health.
- II. Safety-Related Regulations and Standards.
 - A. Regulations Versus Standards.
 - B. Federal Regulations Pertaining to Occupational Safety and Health.
 - C. NFPA Standards Pertaining to Occupational Safety and Health.
- III. Risk Management.
 - A. Risk Evaluation.
 - B. Risk Control.
- IV. Safety Program Development and Management.
 - A. Essential Elements.
 - B. Setting Goals and Objectives.
 - C. Cost/Benefit Analysis.
 - D. Training.
 - E. Developing Standard Operating Procedures.
 - F. Collecting Data.
 - G. Publishing Health and Safety Information.
 - H. Evaluating the Results.
- V. Employee Fitness/Wellness Programs.
 - A. Hazards Faced.
 - B. Organizational Development.
 - C. Employee Acceptance.
 - D. Medical Examinations.
 - E. Physical Fitness.
- VI. Pre-Incident Safety.
 - A. Hazards Faced.
 - B. Station Safety.
 - C. Apparatus Safety.

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- D. Response Safety.
 - E. Pre-Incident Planning.
- VII. Safety at Fire Emergencies.
- A. Hazards Faced.
 - B. Incident Priorities and Safety.
 - C. Incident Management Systems.
 - D. Accountability.
 - E. Rapid Intervention.
 - F. Rehabilitation.
- VIII. Safety at EMS Emergencies.
- A. Hazards Faced.
 - B. Infection Control.
 - C. Personal Protective Equipment.
 - D. Incident Management Systems.
 - E. Scene Safety.
- IX. Safety at Specialized Incidents.
- A. Hazards Faced.
 - B. Safety at Hazardous Materials Incidents.
 - C. Safety at Technical Rescue Incidents.
 - D. Safety at Terrorism Incidents.
 - E. Safety at Natural Disasters.
- X. Post-Incident Safety Management.
- A. Incident Termination.
 - B. Post-Incident Analysis.
 - C. Critical Incident Stress Management.
- XI. Personal Roles.
- A. Individuals.
 - B. Supervisors.
 - C. Managers.
 - D. Incident Commanders.
 - E. Safety Officers.
 - F. Safety Program Managers.
 - G. Safety Committees.
- XII. Making It Happen.
- A. Determining, Measuring and Showcasing the Benefits.
 - B. Selling Management.
 - C. Selling Employees.

Strategy and Tactics (C0279)

Course description

This course provides the principles of fire ground control through utilization of personnel, equipment and extinguishing agents.

Prerequisites

Principles of Emergency Services (C0272).

Course outcomes

Upon completion of this course, you will be able to:

1. Discuss fire behavior as it relates to strategies and tactics.
2. Explain the main components of pre-fire planning, and identify steps needed for a pre-fire plan review.
3. Identify the basics of building construction and how they interrelate to pre-fire planning, strategy and tactics.
4. Describe the steps taken during size-up.
5. Examine the significance of fire ground communications.
6. Identify the roles of the National Incident Management System (NIMS) and Incident Management System (IMS) as it relates to strategy and tactics.
7. Demonstrate the various roles and responsibilities in ICS/NIMS.

Course objectives

Upon completion of this course, you will be able to:

1. Create a strategy and implement appropriate tactics.
2. Possess a working knowledge and execution of IMS/NIMS at the incident.

Available texts

Angle, J. S., Gala, M. F., Jr., Harlow, D., Lombardo, W. B., & Maciuba, C. M. (2015). *Firefighting strategies and tactics* (3rd ed.). Jones & Bartlett Learning. ISBN: 9781284116007. <https://www.psglearning.com/catalog/productdetails/9781284116007>

Avillo, A. (2008). *Fireground strategies* (2nd ed.). PennWell Books. ISBN-10: 1593701594; ISBN-13: 978-1593701598. <https://www.amazon.com/Fireground-Strategies-Anthony-Avillo/dp/1593701594>

International Fire Service Training Association. (2017). *Structural fire fighting: Initial response strategy and tactics* (2nd ed.). Fire Protection Publications. ISBN: 978-0-87939-623-7. <https://www.ifsta.org/shop/structural-fire-fighting-initial-response-strategy-and-tactics-2nd-edition/36180>

Klaene, B. J. (2016). *Structural firefighting: Strategy and tactics* (3rd ed.). Jones & Bartlett Learning. ISBN: 9781449642396. <https://www.psglearning.com/catalog/productdetails/9781449642396>

Smith, J. P. (2012). *Strategic & tactical considerations on the fireground* (3rd ed.). Pearson. ISBN-10: 0-13-283006-X; ISBN-13: 978-0-13-283006-5. <http://www.bradybooks.com/store/product.aspx?isbn=013283006X>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous Materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hsd1.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

References

Brunacini, A. V. (2002). *Fire command: The essentials of local IMS* (2nd ed.). National Fire Protection Association.

Coleman, J. F. (1997). *Incident management for the street-smart fire officer*. PennWell Books.

Coleman, J. F. (2001). *Managing major fires*. PennWell Books.

Dodson, D. W. (2015). *Fire department incident safety officer* (3rd ed.). Jones & Bartlett Learning.

Dunn, V. (1999). *Command and control of fires and emergencies*. PennWell Books.

Klaene, B. J. (2016). *Structural firefighting: Strategy and tactics* (3rd ed.). Jones & Bartlett Learning.

Norman, J. (1998). *Fire officer's handbook of tactics* (2nd ed.). PennWell Books.

Smalley, J. C. (2005). *Protecting life and property from wildfire*. Jones & Bartlett Learning.

Smith, J. P. (2011). *Strategic & tactical considerations on the fireground study guide* (3rd ed.). Trafford Press.

Smith, M. (2011). *Building construction methods and materials for the fire service* (2nd ed.). Pearson.

Current events/news

- <http://www.firehouse.com>
- <http://www.fireengineering.com>
- <http://www.withthecommand.com>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Fire Chemistry Terms and Concepts.
 - A. Heat Transfer.
 - B. Principal Fire Characteristics of Materials.
 - C. Fire Classifications.
- II. Extinguishing Equipment.
 - A. Extinguishing Equipment.
 - B. Fire Apparatus.
 - C. Personnel Requirement.
- III. Visual Perception.
 - A. Pre-Planning.
 - B. Size-Up.
- IV. Pre-Fire Planning.
 - A. Concept.
 - B. Phases.
 - C. Methods.
 - D. Format.
 - E. Occupancy Classifications.
 - F. Building Types.
- V. Basic Divisions of Tactics.
 - A. Size-Up.
 1. Facts.
 2. Probabilities.
 3. Own Situation.
 4. Decision.
 5. Plan of Operation.
- VI. Rescue.
 - A. Life Safety Problems of Fire.
 - B. Determination of Life Hazard.
 - C. Rescue Resources and Operations.

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- VII. Exposures.
 - A. Principle Contributing Factors.
 - B. Exposure Protection Operations.
 - VIII. Confinement.
 - A. Fire Separations.
 - B. Fire Loading.
 - C. Built-In Protection.
 - D. Operations.
 - IX. Ventilation.
 - A. Relationship to Objectives.
 - B. Equipment.
 - C. Roof Types.
 - D. Methods.
 - X. Salvage.
 - A. Relationship to Objectives.
 - B. Equipment.
 - C. Operations During Fire.
 - D. Operations After Fire.

Hazardous Materials Chemistry (C0282)

Course description

This course provides basic chemistry relating to the categories of hazardous materials including recognition, identification, reactivity and health hazards encountered by emergency services.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Identify and describe the common elements of the Periodic Table.
2. Distinguish between elements, compounds and mixtures.
3. Explain the difference between ionic and covalent bonding.
4. Define the basic chemistry involved with common hydrocarbon derivatives.
5. Describe the basic chemical and physical properties of gases, liquids and solids.
6. Discuss the 9 U.S. Department of Transportation hazard classes and their respective divisions.
7. Demonstrate the utilization of guidebooks, MSDSs and other reference materials to determine an initial course of action.

Course objectives

Upon completion of this course, you will be able to:

1. Demonstrate a basic understanding of hazardous materials chemistry.
2. Demonstrate proficiency in the use of DOT guidebooks.

Available texts

Bevelacqua, A., & Norman, L. A. (2019). *Hazardous materials chemistry* (3rd ed.). Jones & Bartlett Learning. ISBN: 9781284041996. <https://www.psglearning.com/catalog/productdetails/9781284041996>

Meyer, E. (2020). *Chemistry of hazardous materials* (7th ed.). Pearson. Print ISBN: 9780135673386. <https://www.pearson.com/us/higher-education/program/Meyer-Chemistry-of-Hazardous-Materials-6th-Edition/PGM131783.html>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous Materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> or <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

References

Association of American Railroads & U.S. Bureau of Explosives. (2003). *Emergency action guides*.

Fire, F. L. (1987). *The common sense approach to hazardous materials*. PennWell Books.

Lewis, R. J. (2008). *Hazardous chemicals desk reference* (6th ed.). Wiley.

National Fire Protection Association (2010). *Fire protection guide to hazardous materials*. Delmar, Cengage Learning.

National Institute for Occupational Safety and Health. (2005). *NIOSH pocket guide to chemical hazards*. Department of Health and Human Services, Centers for Disease Control and Prevention.

U.S. Department of Transportation. (2016). *Emergency response guidebook*.

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Introduction.
 - A. General Characteristics of Hazardous Materials.
 - B. Hazardous Household Products.
 - C. Hazardous Substances in the Workplace.
 - D. Hazardous Materials in Transit.
 - E. Hazardous Materials Within Communities.
 - F. NFPA System of Identifying Potential Hazards.
- II. Matter and Energy.
 - A. Matter and Energy Defined.
 - B. Common Units of Measurement.
 - C. Temperature, Pressure and Volume Relationships.
 - D. Heat Transmission.
 - E. Understanding Fluid Principles.

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- III. Chemical Forms of Matter.
 - A. Elements and Compounds.
 - B. Periodic Classification of Elements.
 - C. The Nature of Chemical Bonding.
 - D. Writing Chemical Formulas.
 - E. Naming Ionic and Covalent Compounds.
 - IV. Principles of Chemical Reactions.
 - A. Types of Chemical Reactions.
 - B. Factors Affecting the Rate of Reaction.
 - C. Oxidation-Reduction Reactions.
 - D. Fire Extinguishing Agents.
 - V. Chemistry of Some Common Elements.
 - A. Oxygen.
 - B. Hydrogen.
 - C. Fluorine.
 - D. Chlorine.
 - E. Phosphorus.
 - F. Sulfur.
 - G. Carbon.
 - VI. Flammable Gases and Liquids.
 - A. Flammability.
 - B. General Hazards of Compressed Gases.
 - C. Storage and Transport of Compressed Gases.
 - D. General Hazards of Flammable Liquids.
 - E. Storage and Transport of Flammable Liquids.
 - F. Response to Flammable Gas and Liquid Emergencies.
 - VII. Chemistry of Some Hazardous Organic Compounds.
 - A. The Nature of Organic Compounds.
 - B. Aliphatic Hydrocarbons.
 - C. Aromatic Hydrocarbons.
 - D. Functional Groups.
 - E. Halogenated Hydrocarbons.
 - F. Alcohols.
 - G. Ethers.
 - H. Aldehydes and Ketones.
 - I. Organic Acids.
 - J. Esters.
 - K. Amines.
 - L. Peroxo-Organic Compounds.
 - VIII. Chemistry of Some Corrosive Materials.
 - A. The Nature of Acids and Bases.
 - B. The PH Scale.

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- C. Acids and Bases as Corrosive Materials.
 - D. Sulfuric Acid.
 - E. Nitric Acid.
 - F. Hydrochloric Acid.
 - G. Perchloric Acid.
 - H. Hydrofluoric Acid.
 - I. Phosphoric Acid.
 - J. Acetic Acid.
 - K. Alkaline Metal Hydroxides.
 - L. Response to Corrosive Material Emergencies.
- IX. Chemistry of Some Water-Reactive Materials.
- A. The Nature of Water-Reactive Materials.
 - B. Alkali Metals.
 - C. Combustible Metals.
 - D. Metallic Hydrides.
 - E. Metallic Phosphides.
 - F. Metallic Carbides.
- X. U.S. Department of Transportation Hazard Classes and Their Divisions.
- A. Identification of Hazardous Materials by Container Shape and Size.
 - B. Identification of Hazardous Materials by Transportation Placards.
 - C. Identification of Hazardous Materials by Shipping Documents.
 - D. Identification of Hazardous Materials by Material Safety Data Sheets (MSDS).
- XI. Hazardous Materials in Fixed Facilities.
- A. Identification of Hazardous Materials by Location and Occupancy.
 - B. Identification of Hazardous Materials by Container Shape and Size.
 - C. Identification of Hazardous Materials by NFPA 704 System.
 - D. Identification of Hazardous Materials by Material Safety Data Sheets (MSDS).
- XII. Response Guidelines.
- A. Utilization of North American Emergency Response Guidebook.
 - B. Utilization of NIOSH Pocket Guide to Chemical Hazards.
 - C. Utilization of NFPA Fire Protection Guide to Hazardous Materials.
 - D. Utilization of Bureau of Explosives Emergency Action Guides.

Fire Investigation I (C0283)

Course description

This course is intended to provide the student with the fundamentals and technical knowledge needed for proper fire scene interpretations, including recognizing and conducting origin and cause, preservation of evidence and documentation, scene security, motives of the fire setter, and types of fire causes.

Prerequisites

Principles of Emergency Services (C0273), Building Construction for Fire Protection (C0275), Fire Behavior and Combustion (C0276) or instructor approval.

Course outcomes

Upon completion of this course, you will be able to:

1. Demonstrate the importance of documentation, evidence collection and the scene security process needed for successful resolution.
2. Understand and demonstrate the process of conducting fire origin and cause investigation.
3. Identify the responsibilities of a firefighter when responding to the scene of a fire, including scene security and evidence preservation.
4. Describe the implications of constitutional amendments as they apply to fire investigations to include case law decisions that have affected fire investigations.
5. Define the common terms used in fire investigations.
6. Explain the basic elements of fire dynamics, construction and fire protection systems as to how they affect origin and cause determination.
7. Discuss the basic principles and identify cause and origin of fires.
8. Recognize potential health and safety hazards.

Course objectives

Upon completion of this course, you will be able to:

1. Demonstrate the importance of documentation, evidence collection and the scene security process needed for successful resolution.
2. Understand and demonstrate the process of conducting fire origin and cause.
3. Identify the processes of proper documentation.

Available texts

Chandler, R. K. (2021). *Fire investigations for first responders*. Jones & Bartlett Learning. ISBN: 9781284180275.

DeHann, J. D., & Icove, D. J. (2012). *Kirk's fire investigation* (7th ed.). Pearson. ISBN-10: 0-13-283000-0; ISBN-13: 978-0-13-283000-3.

International Association of Arson Investigators, International Association of Fire Chiefs, & National Fire Protection Association. (2019). *Fire investigator: Principles and practice to NFPA 921 and 1033* (5th ed.). Jones & Bartlett Learning. ISBN: 9781284140743. <https://www.psglearning.com/catalog/productdetails/9781284140743>

International Association of Arson Investigators & National Fire Protection Association. (2004). *User's manual or NFPA 921* (2nd ed.). Jones & Bartlett Publishers. ISBN-13: 978-0763744021; ISBN-10: 0763744026.

International Fire Service Training Association. (2010). *Fire investigator* (2nd ed.). Fire Protection Publications. ISBN: 978-0-87939-383-0. <https://www.ifsta.org/shop/fire-investigator-2nd-ed/36751>

International Fire Service Training Association. (2013). *Introduction to fire origin and cause* (4th ed.). Fire Protection Publications. ISBN: 978-0-87939-527-8. https://www.ifsta.org/shop/search?search_block_form=introduction+to+fire+cause+and+origin+4th+edition

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> or <http://www.fire.nist.gov/aloft/> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <http://www.firearson.com>
- 🔗 <http://www.interfire.org/>

References

Icove, D. J., DeHaan, J. D., & Haynes, G. A. (2003). *Forensic fire scene reconstruction*. Prentice Hall.

International Fire Service Training Association. (2010). *Fire investigator* (2nd ed.). Fire Protection Publications.

National Fire Protection Association. (2014). *Standard for professional qualifications for fire investigator* [Standard no. 1033]. www.nfpa.org

National Fire Protection Association. (2017). *Guide for fire and explosion investigations*. [Standard no. 921]. www.nfpa.org

Redsicker, D. R., & O'Connor, J. J. (1996). *Practical fire and arson investigation* (2nd ed.). CRC Press.

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Emergency Responder Responsibilities and Observations.
 - A. Responsibilities of the Fire Department.
 - B. Responsibilities of the Firefighter.
 - C. Responsibilities of the Fire Officer.
 - D. Observations When Approaching the Scene.
 - E. Observations Upon Arrival.
 - F. Observations During Firefighting Operations.
 - G. Identification of Incendiary Devices.
- II. Constitutional Law.
 - A. Criminal Law.
 - B. Constitutional Amendments.
- III. Case Studies.
 - A. Michigan v. Tyler.
 - B. Michigan v. Clifford.
 - C. Daubert Decision.
 - D. Benfield Decision.
 - E. Kuhmo/Carmichael Decision.
- IV. Fire Investigations Terminology.
 - A. Terms as They Apply to Structural Fires.
 - B. Terms as They Apply to Vehicle Fires.
 - C. Other Common Investigative Terms.
- V. Basic Elements of Fire Dynamics.
 - A. Ignition.
 - B. Heat Transfer.
 - C. Flame Spread.
 - D. Burning Rate.
 - E. Fire Plumes.
 - F. Fire Analysis.
- VI. Building Construction.
 - A. Types of Construction.
 - B. Building Materials.
 - C. Building Components.

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- VII. Fire Protection Systems.
 - A. Extinguishment Systems.
 - B. Detection Systems.
 - C. Signaling Systems.
 - D. Other Building Services.
 - VIII. Basic Principles of Electricity.
 - A. Basic Electricity.
 - B. Wiring Systems.
 - C. Common Electrical Systems.
 - IX. Health and Safety.
 - A. Methods of Identification.
 - B. Common Causes of Accidents.
 - C. Common Causes of Injuries.
 - X. Fire Scene Investigations.
 - A. Examining the Fire Scene.
 - B. Securing the Fire Scene.
 - C. Documenting the Fire Scene.
 - D. Evidence Collection and Preservation.
 - E. Exterior Examination.
 - XI. Determining Point of Origin.
 - A. Interior Examination.
 - B. Area of Origin.
 - C. Fire Patterns.
 - D. Other Indicators.
 - E. Scene Reconstruction.
 - F. Point of Origin.
 - XII. Types of Fire Causes.
 - A. Accidental.
 - B. Natural.
 - C. Incendiary.
 - D. Undetermined.
 - XIII. Vehicle Fires.
 - A. Examination of Scene.
 - B. Examination of Exterior.
 - C. Examination of Driver and Passenger Areas.
 - D. Examination of Engine Compartment.
 - E. Examination of Fuel System.
 - F. Examination of Electrical System.
 - XIV. Fire Setters.
 - A. Characteristics of Arson.
 - B. Common Motives.

Fire Investigation II (C0284)

Course description

This course is intended to provide the student with advanced technical knowledge on the rule of law, fire scene analysis, fire behavior, evidence collection and preservation, scene documentation, case preparation, and courtroom testimony.

Prerequisites

Fire Investigation I (C0238).

Course outcomes

Upon completion of this course, you will be able to:

1. Recognize the need for the use of the scientific method for investigations.
2. Explain the rule of law as it pertains to arrest, search and seizure.
3. Describe the nature and behavior of fire as it relates to fire dynamics.
4. Analyze and determine the causes of fires and contributing factors.
5. Evaluate the use of incendiary devices, explosives and bombs.
6. List the procedures for fire scene documentation, including sources and technology available for fire investigations.
7. Explain the role of the fire investigator in courtroom demeanor and testifying.

Course objectives

Upon completion of this course, you will be able to:

1. Explain the significance of the rule of law.
2. Analyze fire cause.
3. Recognize the different classifications of arson.

Available texts

DeHann, J. D., & Icove, D. J. (2012). *Kirk's fire investigation* (7th ed.). Pearson. ISBN-10: 0-13-283000-0; ISBN-13: 978-0-13-283000-3.

International Association of Arson Investigators, International Association of Fire Chiefs, & National Fire Protection Association. (2019). *Fire investigator: Principles and practice to NFPA 921 and 1033* (5th ed.). Jones & Bartlett Learning. ISBN: 9781284140743. <https://www.psglearning.com/catalog/productdetails/9781284140743>

International Association of Arson Investigators & National Fire Protection Association. (2004). *User's manual or NFPA 921* (2nd ed.). Jones & Bartlett Publishers. ISBN-13: 978-0763744021; ISBN-10: 0763744026.

International Fire Service Training Association. (2010). *Fire investigator* (2nd ed.). Fire Protection Publications. ISBN: 978-0-87939-383-0. <https://www.ifsta.org/shop/fire-investigator-2nd-ed/36751>

International Fire Service Training Association. (2013). *Introduction to fire origin and cause* (4th ed.). Fire Protection Publications. ISBN: 978-0-87939-527-8. https://www.ifsta.org/shop/search?search_block_form=introduction+to+fire+cause+and+origin+4th+edition

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous Materials, Health and Safety, Wildfires.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> or <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hsd.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <http://www.firearson.com>

References

Almirall, J. R., & Furton, K. G. (Eds.). (2004). *Analysis and interpretation of fire scene evidence*. CRC Press.

Icove, D. J., DeHaan, J. D., & Haynes, G. A. (2003). *Forensic fire scene reconstruction*. Prentice Hall.

National Fire Protection Association. (2016). *Standard classifications for incident reporting and fire protection data* [Standard no. 901]. www.nfpa.org

National Fire Protection Association. (2017). *Guide for fire and explosion investigations* [Standard no. 921]. www.nfpa.org

National Insurance Crime Bureau. (2019). *Passenger vehicle identification manual*.

U.S. Department of Justice, Office of Justice Programs, National Institute of Justice. (2000). *Fire and arson scene evidence: A guide for public safety personnel*.

Waggoner, K. (Ed.). (2007). *Handbook of forensic services*. FBI Laboratory.

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Rule of Law.
 - A. Arrest Procedures.
 - B. Search and Seizure.
 - C. Warrant Searches.
- II. Interpretations of Fire Scenes.
 - A. Structure Fires.
 - B. Vehicle Fires.
 - C. Ship Fires.
 - D. Explosions.
 - E. Wildland Fires.
 - F. Hazardous Materials Fires.
- III. Chemistry of Combustion.
 - A. Atoms.
 - B. Elements.
 - C. Compounds.
 - D. Organic Compounds.
- IV. Behavior of Fire.
 - A. Heat.
 - B. Flame Plumes.
 - C. Sequence of a Room Fire.
 - D. Effects of Environmental Conditions.
- V. Combustion Properties.
 - A. Liquids.
 - B. Gases.
 - C. Solids.
- VI. Electrical Causes of Fires.
 - A. Wiring Systems.
 - B. Ignition Sources.
 - C. Investigation of Fires.
- VII. Collection of Evidence.
 - A. Photography Procedures.
 - B. Sketching Procedures and Techniques.
 - C. Fingerprint Lifting and Collection Techniques.
 - D. Preservation of Evidence.
- VIII. Incendiary Systems.
 - A. Basic Incendiary Devices.
 - B. Explosives.
 - C. Bombs.

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- IX. Documentation of Fire Scene.
 - A. Sketches.
 - B. Photographs.
 - C. Incident Reports.
 - D. Log Sheets.
 - E. Investigation Report.
 - F. Chain of Custody.

 - X. Investigation of Fire-Related Deaths and Injuries.
 - A. Homicide Fire Investigation.
 - B. Scene Security.
 - C. Scene Examination and Search.
 - D. Scene Documentation.
 - E. Autopsy Report.

 - XI. Interview Techniques.
 - A. Interviewing.
 - B. Questioning.
 - C. Advising of Rights.
 - D. Exceptions to the Rule.
 - E. Waiver of Rights.

 - XII. Courtroom Demeanor.
 - A. Court Procedures.
 - B. Pre-Trial Preparation.
 - C. Trial Exhibits.
 - D. Physical Appearance.
 - E. Testifying.
 - F. Court Decisions.

 - XIII. Court Decisions.
 - A. Daubert Decision.
 - B. Benfield Decision.
 - C. Kuhmo/Carmichael Decision.

 - XIV. Sources of Information.
 - A. Local.
 - B. State.
 - C. Federal.
 - D. Website.



Aviation Fire Officer Emphasis

Airport Firefighter

Course description

This course explores the theories and fundamentals associated with airport rescue firefighting and addresses safety, operations and agents associated with aircraft rescue and firefighting procedures. It provides an overview of communications, apparatus, tools and equipment specific to the aerospace emergency service delivery.

Note: Course requirements are met by an Airport Firefighter Certification (International Fire Service Accreditation Congress (IFSAC); ProBoard; International Civil Aviation Organization (ICAO); U.S. Department of Defense (DoD); Federal Aviation Administration (FAA)).

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Define the role and qualifications of the airport firefighter.
2. Discuss airport and aircraft familiarization.
3. Discuss safe practices associated with airport firefighting operations.
4. Describe aircraft rescue and firefighting apparatus and equipment.
5. Identify fire-extinguishing agents associated with aerospace firefighting.
6. Discuss tactical objectives associated with aircraft emergency response.
7. Describe airport emergency planning.
8. Identify hazardous situations associated with aircraft fire rescue and fire suppression activities.

Trait

Increased awareness of airport firefighter operations and safety, to include aviation emergency management incidents.

Available text

International Fire Service Training Association. (2015). *Aircraft rescue and firefighting* (6th ed.).

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/>

Applied research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

NETC Library: <http://www.usfa.fema.gov/library/>

FAA: <http://www.faa.gov>

National Transportation Safety Board (NTSB): <http://www.nts.gov>

Assessments

Academic papers, discussions, projects, quizzes, exams.

Point of contact

Dr. Eric James Russell, Utah Valley University — Department of Emergency Services
eric.russell@uvu.edu

Aircraft Mishaps

Course description

This course teaches the learner how to locate and use past aircraft accident and mishap data from various government agencies in order to develop relevant lesson plans and training courses for emergency responders. Learning how to research this information will strengthen emergency service agencies involved in aircraft rescue firefighting by giving them the tools and knowledge to develop relevant guidelines, protocols, procedures and training evolutions based on current mishaps and findings.

Prerequisites

Airport Firefighter Certification (IFSAC; ProBoard; ICAO; DoD; FAA).

Course outcomes

Upon completion of this course, you will be able to:

1. Cite examples of databases pertaining to the aerospace mishaps.
2. Discuss current mishaps within the aviation sector.
3. Describe the investigation process associated with aircraft accidents.
4. Describe how to properly use aviation database information.
5. Report on database findings.

Trait

Increased awareness of aerospace mishap databases and media reports to create guidelines, procedures and protocols related to aircraft emergency responses.

Available text

Krause, S. (2003). *Aircraft safety: Accident investigations, analyses, and applications*. McGraw-Hill.

Supporting references/research for faculty and students

U.S. Fire Administration publications: <https://apps.usfa.fema.gov/publications/>

Applied research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

NETC Library: <http://www.usfa.fema.gov/library/>

FAA: <http://www.faa.gov>

NTSB: <http://www.nts.gov>

Assessments

Academic papers, discussions, projects, quizzes, exams.

Point of contact

Dr. Eric James Russell, Utah Valley University — Department of Emergency Services
eric.russell@uvu.edu

Aircraft-Related Mass Casualty Incidents

Course description

This course involves the planning, response, mitigation and management of a mass casualty incident resulting from a crashed aircraft. Includes issues relating to medical treatment, triage and transportation. It examines how the command structure functions, as well as how operations personnel work on the scene of a mass casualty incident.

Prerequisites

Airport Firefighter Certification (IFSAC; ProBoard; ICAO; DoD; FAA).

Course outcomes

Upon completion of this course, you will be able to:

1. Discuss the incident management systems.
2. Discuss the role of command, its structure and components.
3. Define the operation structures within the emergency response system.
4. Identify hazardous conditions and ways to mitigate situations.

Traits

1. Increased awareness of operations on the scene of an aerospace vehicle mishap involving multiple incidents and victims.
2. Increased awareness of the incident management system, command structures and operation sector roles.

Available text

Christen, H., & Maniscalco, P. (2002). *Mass casualty and high-impact incidents: An operations guide*. Prentice Hall.

Supporting references/research for faculty and students

U.S. Fire Administration publications: <https://apps.usfa.fema.gov/publications/>

Applied research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

NETC Library: <http://www.usfa.fema.gov/library/>

FAA: <http://www.faa.gov>

NTSB: <http://www.nts.gov>

Assessments

Academic papers, discussions, projects, quizzes, exams.

Point of contact

Dr. Eric James Russell, Utah Valley University — Department of Emergency Services
eric.russell@uvu.edu

Aviation Terrorism Response

Course description

This course deals with the threats associated with terrorism and the aviation industry as they relate to the emergency service response. It examines past acts of terror along with present and future threats and their connection to aerospace emergency services planning and response. The course identifies various aspects of aviation security and control in correlation to the emergency responders' responsibilities.

Prerequisites

Airport Firefighter Certification (IFSAC; ProBoard; ICAO; DoD; FAA).

Course outcomes

Upon completion of this course, you will be able to:

1. Discuss the threats toward the aviation industry involving terrorism.
2. Describe the historical components and the extremist groups associated with terrorism.
3. Identify counterterrorism groups and the aspects of preventing terrorist acts.
4. Describe the aspects of aviation security.
5. Review concerns and controls associated with aviation security.

Trait

Increased awareness of terrorist threats and concerns associated with aviation emergency response.

Available text

Sweet, K. (2008). *Aviation and airport security: Terrorism and safety concerns* (2nd ed.). CRC Press.

Supporting references/research for faculty and students

U.S. Fire Administration publications: <https://apps.usfa.fema.gov/publications/>

Applied research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

NETC Library: <http://www.usfa.fema.gov/library/>

FAA: <http://www.faa.gov>

NTSB: <http://www.nts.gov>

Assessments

Academic papers, discussions, projects, quizzes, exams.

Point of contact

Dr. Eric James Russell, Utah Valley University — Department of Emergency Services
eric.russell@uvu.edu

Airport Operations for the Emergency Responder

Course description

This course offers responders an understanding of ground operations, communications, layout, movements and functions in order to operate effectively within the boundaries of an airport. It discusses the complex, unfamiliar settings responders face associated with daily operations of an airport.

Prerequisites

Airport Firefighter Certification (IFSAC; ProBoard; ICAO; DoD; FAA).

Course outcomes

Upon completion of this course, you will be able to:

1. Discuss specific airport operation systems.
2. Describe the characteristics associated with airport operations.
3. Identify services at airports.
4. Review high-hazard, emergency and security concerns at airports.
5. Describe airport accesses and movement.
6. Discuss terminal operations.

Trait

Increased awareness of common daily airport operations.

Available text

Ashford, N., Stanton, M., & Moore, A. (2012). *Airport operations* (2nd ed.). McGraw-Hill.

Supporting references/research for faculty and students

U.S. Fire Administration publications: <https://apps.usfa.fema.gov/publications/>

Applied research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

NETC Library: <http://www.usfa.fema.gov/library/>

FAA: <http://www.faa.gov>

NTSB: <http://www.nts.gov>

Assessments

Academic papers, discussions, projects, quizzes, exams.

Point of contact

Dr. Eric James Russell, Utah Valley University — Department of Emergency Services
eric.russell@uvu.edu

Bachelor's (Core)

Political and Legal Foundations for Fire Protection (C0258)

Course description

This course examines the legal aspects of the fire service and the political and social impacts of legal issues. This course includes a review of the American legal system and an in-depth coverage of legal and political issues involving employment and personnel matters, administrative and operational matters, planning and code enforcement, and legislative and political processes with regard to the fire service.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Identify potential legal and political issues in fire and emergency services.
2. Describe legal lessons learned from recent cases, and identify best practices in the fire service to avoid legal liability.
3. Analyze and apply legal rules and political issues to manage risk.
4. Formulate political and legal conclusions and recommendations based on the analysis.
5. Locate and apply recent legal and legislative online resources.

Course objectives

Module 1: Overview of the Law

After completing this module, you will be able to:

1. Describe the differences between different types and branches of law.
2. Identify classes of actions, such as tort, contract and property.
3. Explain the system of law and its functions.
4. Explain the importance to the fire service of the due process clause of the 14th Amendment.
5. Define criminal and administrative warrants.
6. Describe the circumstances requiring warrants and exceptions.
7. Define sovereign immunity and Good Samaritan protection as they relate to the fire service.

Module 2: Employment and Personnel Issues

After completing this module, you will be able to:

1. Explain the U.S. constitutional law as it affects employment and personnel issues in the fire service.
2. Explain the impact of the First, Fourth, Fifth, and 14th Amendments on personnel and employment laws.
3. Describe how federal, state and local laws affect personnel and employment issues in the fire service.
4. Analyze issues and provide supportable conclusions by applying appropriate federal, state or local laws concerning labor relations, employee performance, employee discrimination, employee privacy and compensation, workers' compensation, and employee benefits.
5. Recognize and identify behaviors and situations that may lead to or contribute to claims of violations of constitutional protections.

Module 3: Operational and Managerial Issues

After completing this module, you will be able to:

1. Articulate and explain the legal duties of fire departments and department members.
2. Identify local and state cases and laws that affect operational and managerial issues in your fire department.
3. Explain specific impacts of federal laws and existing federal decisions on operational and managerial issues in the fire service.
4. Identify behaviors and practices that may extend liability or increase the likelihood of litigation.
5. Evaluate and describe policies and procedures for potential legal impact.

Module 4: The Fire Official as Rule-maker and Enforcer

After completing this module, you will be able to:

1. Identify common model fire codes and determine applicable state and local codes in use in a specific location.
2. Describe the process of code creation and adoption.
3. Explain the legal basis for code enforcement action.
4. Describe legal issues that define and affect the enforcer's role.
5. Explain how fire officers can facilitate code adoption and modification processes.
6. Develop legally sound policies and procedures for the administration of code enforcement activities.

Module 5: Legislative and Political Foundations

After completing this module, you will be able to:

1. Explain how public opinion and political culture affect fire service law enforcement functions.
2. Identify allies and adversaries in the legislative process as it affects fire service interests.
3. Describe ways the fire official can influence the budgeting process effectively.
4. Explain the legal concerns regarding acquisition and public records.

Available texts

Bennett, L. T. (2017). *Fire service law* (2nd ed.). Waveland Press.

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Course outline

- I. Nature of Law.
 - A. Sources of Law.
 - B. Rule of Law.
 - C. Functions of Law.
 - D. Limitations of Law.
- II. Types of Law.
 - A. Civil and Common Law.
 - B. Statutory and Common Law.
 - C. Criminal and Civil Law.
- III. Institutions of Law.
 - A. Function of Courts.
 - B. State Courts.
 - C. Federal Courts.
 - D. The Supreme Court of the United States.
 - E. Regulatory Agencies.
- IV. Civil and Criminal Trials.
 - A. The Function of Trials.
 - B. Methods of Conducting Trials.
 - C. Constitutional Rights of Criminal Defendants.
 - D. Steps in a Civil Trial.
 - E. Multiple Suits and Prosecutions for the Same Act.
- V. Warrants and Alternatives to Trial.
 - A. Warrants.
 - B. Warrants and the Fire Service.

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- C. Alternatives to Trial.
 - D. Nonjudicial Methods for Resolving Disputes.
- VI. Constitutional Law — Employment and Personnel Issues.
- A. Historical Perspective on the Constitution.
 - B. Amendments to the Constitution.
- VII. Federal Law — Employment and Personnel Issues.
- A. Historical Overview of Federal Law as it Relates to Personnel and Employment Issues.
 - B. Federal Laws and Impact on Personnel and Employment Issues.
- VIII. State and Local Law — Employment and Personnel Issues.
- A. Common Law and Common Sense Personnel Management Responsibility.
 - B. The Federal Connection.
 - C. State Law as it Relates to Personnel and Employment Issues.
 - D. Local Government Personnel Systems.
- IX. Operational and Managerial Issues.
- A. Operational and Managerial Issues.
 - B. Sovereign Immunity, Negligence and Torts.
 - C. Constitutional Matters.
 - D. Rules, Laws, Standards, Codes and Mandates.
 - E. Legal Issues in Acquiring Resources.
- X. The Fire Official as Rule-Maker and Enforcer.
- A. The Administrative Procedures Act.
 - B. Model Code Process.
 - C. Special Problems in Adoption of Codes.
 - D. Purpose and Methods for Obtaining Code Compliance.
 - E. Enforcement Models.
 - F. Liability Issues in Code Enforcement.
- XI. Politics in Action.
- A. Politics Defined.
 - B. Making Law.
 - C. Affecting Legislation.
 - D. Policy Analysis.
- XII. Politics and Budgeting.
- A. Politics and the Budget Process.
 - B. Fire Department Strategies in Politics and Budgeting.

Applications of Fire Research (C0260)

Course description

This course examines the basic principles of research and methodology for analyzing current fire-related research. The course also provides a framework for conducting and evaluating independent research in the following areas: fire dynamics, fire test standards and codes, fire safety, fire modeling, structural fire safety, life safety, firefighter health and safety, automatic detection and suppression, transportation fire hazards, risk analysis and loss control, fire service applied research, and new trends in fire-related research.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Locate, evaluate and analyze fire-related research.
2. Demonstrate the application of fire research to a research problem that is related to one of the course topics.
3. Conduct a literature review of current research on a fire-related topic.
4. Write a fire-related research proposal.
5. Design a research plan using one or more qualitative and/or quantitative methodologies.

Course objectives

Module I: Fundamentals

After completing this module, you will be able to:

1. Consider what research is and why we study it.
2. Understand fire-related research objectives.
3. Analyze and discuss fire research goals and objectives in relation to the National Institute of Standards and Technology (NIST)-led technical investigation of the World Trade Center disaster.
4. Research, evaluate and discuss sources from which information on fire research is available.
5. Identify fire research organizations and programs that have applications to the fire service.
6. Identify areas of fire-related research.
7. Conduct a preliminary review of current research in a chosen fire-related topic.
8. Investigate, evaluate and interpret research in the area of fire dynamics.
9. Investigate, evaluate and interpret research in the area of fire test standards and codes.

Module II: Focusing Your Research Efforts

After completing this module, you will be able to:

1. Define research and its foundations.
2. Introduce research methods and approaches.
3. Understand the scientific method.
4. Conceptualize a strategy for generating research problems.
5. Formulate a suitable research problem in an area of fire science.
6. Develop a preliminary research proposal outline.
7. Distinguish between testing and experimental research.
8. Compare the results of mathematical fire modeling to full-scale fire testing.
9. Distinguish between small-, medium- and large-scale tests and when it is appropriate to use them.
10. Understand sampling procedures.
11. Investigate, evaluate and interpret research in the area of fire safety properties and flammability tests.
12. Investigate, evaluate and interpret research in the area of fire modeling.

Module III: Qualitative Research Methodologies

After completing this module, you will be able to:

1. Develop a familiarity with qualitative research methods and approaches.
2. Apply concepts of qualitative methods to fire-related research.
3. Select appropriate qualitative methods according to the type of research question raised.
4. Interpret conclusions drawn from qualitative methods, based on an analysis of the strengths and weaknesses of the methodology.
5. Conduct a literature review related to a fire research problem.
6. Investigate, evaluate and interpret research in the area of structural fire safety.
7. Investigate, evaluate and interpret research in the area of life safety.
8. Investigate, evaluate and interpret research in the area of firefighter health and safety.

Module IV: Quantitative Research Methodologies

After completing this module, you will be able to:

1. Develop a familiarity with quantitative research methods and approaches.
2. Apply concepts of quantitative methods to fire-related research.

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3. Apply statistical concepts and data analysis to quantitative research design.
 4. Select an appropriate quantitative design when the conditions of the research problem demand measurement of variables and relationships.
 5. Select appropriate statistical techniques according to the type of research question raised within a quantitative study.
 6. Interpret conclusions drawn from statistics, as to whether or not they reflect the true properties of phenomena under study.
 7. Design a research project within a fire research subfield and establish techniques for data gathering and analysis.
 8. Investigate, evaluate and interpret research in the area of automatic detection and suppression.
 9. Investigate, evaluate and interpret research in the area of transportation fire hazards.
 10. Investigate, evaluate and interpret research in the area of risk analysis and loss control.

Module V: Applications and Trends in Fire-Related Research

After completing this module, you will be able to:

1. Consider applications of fire-related research to fire safety and prevention.
2. Consider future developments in fire-related research.
3. Propose specific areas for future research and testing.
4. Discuss how your research proposal relates to either applications of fire-related research, future trends in fire-related research or both.
5. Investigate, evaluate and interpret research in the area of fire service applied research.
6. Investigate, evaluate and interpret research in the area of new trends in fire-related research.
7. Complete a formal research proposal in a fire-related field, applying either qualitative or quantitative methods or a combination of both.

Available texts

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Leedy, P. D., & Ormrod, J. E. (2016). *Practical research: Planning and design* (11th ed.). Pearson. ISBN-13:9780133741322.

Course outline

- I. Research Defined.
 - A. The Research Process.
 - B. Fire Research.
 - C. Research Organizations.
 - D. Technology.
- II. Fire Dynamics.
 - A. Basic Fire Science.
 - B. Research Applications in Fire Dynamics.
- III. Fire Safety Properties and Flammability Tests.
 - A. Modern Test Methods for Flammability.
- IV. Fire Test Standards and Codes.
 - A. Standards-Making Organizations.
 - B. Code Requirements.
 - C. Code Research Organizations.
- V. Fire Modeling.
 - A. Types.
 - 1. Mathematical Fire Models.
 - 2. Simulation Models.
 - 3. Zone Models.
 - 4. Field Models.
 - 5. Fire Safety Models.
 - B. Validating Fire Models.
 - C. The Future of Fire Modeling.
- VI. Structural Fire Safety.
 - A. Fire Endurance Testing.
 - B. Wood Trusses.
 - C. Smoke Control.
 - D. Active and Passive Fire Protection.
- VII. Automatic Detection and Suppression.
 - A. Detection and Alerting Systems.
 - B. Automatic Sprinklers.
 - C. Ongoing Research.
 - D. Halon Research Programs.
- VIII. Life Safety.
 - A. Toxicology of Fire and Smoke.
 - B. Potency Measurement.
 - C. Human Behavior in Fire Incidents.
 - 1. Evacuation and Egress Studies.

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- IX. Transportation Fire Hazards.
 - A. Hazardous Materials Transportation.
 - B. Subway and Railroad Passenger Transportation Systems.
 - C. Aircraft Fire Technology Programs.
 - D. Marine Fire Safety.

 - X. Risk Analysis and Loss Control.
 - A. Fire Risk Analysis.
 - 1. Methods of Fire Risk Analysis.
 - B. Product Fire Risk Analysis.
 - C. Municipal Fire Risk Analysis.
 - D. Fire Risk Management.

 - XI. Firefighter Health and Safety.
 - A. Occupational Hazards.
 - B. Research.

 - XII. Fire Safety Applied Research.
 - A. Effectiveness of Fire Protection.
 - B. Organization.
 - C. Deployment.
 - D. Operations.
 - E. In-House Fire Department Research.

 - XIII. Trends in Fire Related Research.
 - A. Wildland/Urban Interface Research.
 - B. Non-thermal Fire Damage.
 - C. Fire Dynamics.
 - D. Fire Modeling.
 - E. Quantitative Risk Assessment.

Fire Prevention Organization and Management (C0264)

Course description

This course empowers students with knowledge, methods and concepts for effective leadership of comprehensive fire-prevention and risk-reduction programs.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Explain the role of fire prevention in community risk reduction.
2. Analyze code enforcement and plans review concepts.
3. Analyze fire and life safety education concepts.
4. Analyze methods for effective fire, arson and explosion investigation
5. Examine historical events and their influence on fire prevention.
6. Examine social, cultural and behavioral concepts that influence effective prevention programs.
7. Identify and analyze local, state and federal resources.
8. Examine methods to enhance professional development of fire prevention and other emergency service personnel.
9. Examine policies, procedures and impacts of effective fire-prevention efforts.
10. Analyze budgeting and program funding concepts.

Course objectives

Upon completion of this course, you will be able to:

1. Explain the administrative and leadership role of a comprehensive fire-prevention program.
2. Examine strategies for effective management of comprehensive fire-prevention programs.
3. Analyze the role of effective fire prevention in the overall community risk-reduction program.
4. Review cultures, social norms and behaviors within a community.

Available texts

Carter, H. R., & Rausch, E. (2017). *Management in the fire service* (5th ed.). Jones & Bartlett Learning. ISBN: 9781449690786. <https://www.psglearning.com/catalog/productdetails/9781449690786>

Crawford, J. (2011). *Fire prevention organization and management*. Pearson. ISBN: 9780135087848.

Icove, D. J., DeHaan, J. D., & Haynes, G. A. (2013). *Forensic fire scene reconstruction* (3rd ed.). Pearson. ISBN-10: 0-13-260577-5; ISBN-13: 978-0-13-260577-9. <http://www.bradybooks.com/store/product.aspx?isbn=0132605775>

International Fire Service Training Association. (2016). *Fire inspection and code enforcement* (8th ed.). Fire Protection Publications. ISBN: 978-0-87939-605-3. <https://www.ifsta.org/shop/fire-inspection-and-code-enforcement-8th-edition/36299>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Point of contact

Steven Bardwell, Waldorf University, Iowa (601-624-3777)
Email: steven.bardwell@waldorf.edu.

Course outline

- I. Overview of Comprehensive Fire Prevention Efforts.
 - A. Comprehensive Programs — Plan Review, Code Enforcement, Public Education, Coalitions Development and Investigation.
 - B. Elements of Juvenile Firesetting Intervention.
 - C. Administration and Leadership of the Fire Marshal.
 - D. How Research Sets a Foundation for Fire Prevention.
- II. Educational Programs.
 - A. Public Education, Public Information and Public Relation Programs.
 - B. The Planning Process for Public Fire and Life Safety Education Programs.
 - C. The Importance of Coalition Development and Community Involvement.
 - D. The Relationships Among Arson Prevention, Public Education and Other Community Fire/Life Safety Efforts.
- III. Code Enforcement.
 - A. Codes and Standards.
 1. Contrasting Issues.
 2. Legal Basis.
 3. Interfaces of National, State and Local Codes.
 4. Code Administration.
 5. Inspection Practices.
 6. The Appeal Process.
 7. Mini-Max Concept.
- IV. Plans Review.
 - A. Interrelationship Between the Fire Code and Other Codes.
 - B. Performance Codes and Prescriptive Codes.
 - C. The Appeal Process for Plans Review for New Construction.

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- V. Fire, Arson and Explosion Investigation.
 - A. Fire Cause Determination for Unintentional and Purposely Set Fires.
 - B. Data Collection and Preservation of Evidence.
 - C. Rights, Responsibilities and Legal Limits of the Investigator.
 - D. How Cause and Origin Relates to Community Fire Prevention.
 - VI. Fire Prevention Research and Fire Prevention Planning.
 - A. Types of Research.
 - 1. Pure.
 - 2. Applied.
 - B. The Application of Fire Prevention Research.
 - 1. Organizations Conducting Research.
 - 2. The Value of Research.
 - C. Planning Strategies.
 - 1. Master Planning.
 - 2. Strategic Planning.
 - 3. Tactical Planning.
 - 4. Advantages and Major Obstacles of Planning.
 - VII. Historical Influence of Fire Prevention.
 - A. Significant Fires in U.S. History.
 - 1. Relationship of Fires.
 - 2. Resulting Efforts to Improve Fire Safety and Prevention Efforts.
 - VIII. Social, Cultural and Economic Influences on Fire Prevention.
 - A. Cultural Beliefs and Traditions.
 - 1. Multicultural Society and Beliefs.
 - 2. The Impact of Cultures.
 - 3. The Impact of the Fire Service Culture.
 - 4. Economic Factors.
 - a. Policies Programs.
 - b. Economic Trade-Offs.
 - 5. Direct and Indirect Fire Losses.
 - a. High Costs of Fire.
 - b. Lower Perception of Fire Risk.
 - IX. Organizing Fire Prevention Programs and Staff.
 - A. Options for Staffing and Funding Programs.
 - B. Fire Prevention as Part of Community Efforts.
 - C. Effective Leadership in Fire Prevention Efforts.

Personnel Management for the Fire Service (C0266)

Course description

This course examines relationships and issues in personnel administration and human resource development within the context of fire-related organizations, including personnel management, organizational development, productivity, recruitment and selection, performance management systems, discipline, and collective bargaining.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Identify and explain contemporary personnel management issues.
2. Explain potential personnel management issues.
3. Classify the collective rules, procedures, laws and policies that relate to personnel management issues.
4. Analyze simple/complex personnel management issues from recruitment to selection, as well as retention.
5. Formulate recommendations and solutions to personnel management issues.
6. Explore organizational development and leadership styles and how they relate to personnel relationships.

Course objectives

Module I: Introduction to Personnel Management and Organizational Development

After completing this module, you will be able to:

1. Analyze the societal influences and issues affecting personnel management.
2. Demonstrate and evaluate how the 4 values serve as benchmarks for public agencies.
3. Analyze and evaluate how their organizations measure up to the 5 values associated with a positive work environment.
4. Apply the major functions of personnel management to a program or project.
5. Illustrate a systematic approach to solving fire and emergency services personnel and organizational problems.

Module II: Motivation and Productivity

After completing this module, you will be able to:

1. Compare, contrast and evaluate the major theories of motivation.
2. Compare, contrast and evaluate the 3 managerial approaches to motivation.

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3. Research and analyze an issue that has an impact on organizational productivity and effectiveness.
 4. Compare, contrast and evaluate the different approaches to quality management and productivity.

Module III: Recruitment, Selection, Promotion and Human Resource Development

After completing this module, you will be able to:

1. Compare and contrast the provisions associated with Equal Employment Opportunity (EEO) and Affirmative Action, and analyze the potential impact of the Americans with Disabilities Act (ADA) on employment in the emergency services.
2. Create an environment for the prevention of sexual harassment and discrimination.
3. Analyze the general impact of various legislations and case laws on employment decision issues, especially those relating to recruitment and selection of personnel.
4. Analyze the importance of the job analysis and job description with reference to personnel management functions.
5. Analyze and critique an agency's program for recruitment, selection, human resource development, promotion and training, and offer recommendations for improvement.
6. Compare and contrast training and education, mandatory training versus discretionary training, and technical skills training versus organizational training.

Module IV: Performance Management, Performance Appraisal, Corrective Action and Discipline

After completing this module, you will be able to:

1. Compare, contrast and evaluate different approaches to performance appraisal.
2. Demonstrate the appropriate evaluation procedures for performance-based criteria.
3. Differentiate between the concepts of corrective action and discipline, and analyze the appropriate administration of discipline.
4. Illustrate how corrective measures benefit fire and emergency services personnel, as well as organizations.
5. Evaluate performance management, corrective actions and disciplinary systems.

Module V: Employee and Labor Relations

After completing this module, you will be able to:

1. Analyze agency strengths and weaknesses regarding compensation and health and safety programs and how they relate to motivation, morale and productivity.
2. Research the trends and issues in contemporary society that affect the labor-management climate.

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3. Analyze the components of a collective bargaining agreement, and determine what issues are negotiable and nonnegotiable.
 4. Compare and contrast position versus interest-based bargaining techniques in arriving at a collective bargaining agreement.
 5. Analyze the impact of mediation and binding arbitration on the collective bargaining process.

Available texts

Antonellis, P. J. (2012). *Labor relations for the fire service*. PennWell Books. ISBN: 9781593702847.

Edwards, S. T. (2010). *Fire service personnel management* (3rd ed.). Pearson. <http://www.bradybooks.com/store/product.aspx?isbn=0135126770>

Kearney, R. C., & Coggburn, J. D. (2016). *Public human resource management* (6th ed.). CQ Press. ISBN: 978-1-4833-9345-2.

Trauernicht, N. J. (in press). *Human resource management for the fire service*. Jones & Bartlett Learning.

Course outline

- I. The Importance of Personnel.
 - A. History of Labor Movement in the U.S.
 - B. Chronology of Significant U.S. Labor Relations.
- II. Personnel Management and Organizational Development.
 - A. Functions of Management and Leadership.
 - B. Human Resource Management.
 - C. Systems Approach to Program and Personnel Planning.
- III. Motivation and Individual Productivity.
 - A. Personnel Orientation Roles.
 - B. Classic Management Theories.
 - C. Levels of Job Satisfaction.
- IV. Recruitment and Selection of Personnel.
 - A. Selection Processes.
 - B. Affirmative Action and EEO Programs.
- V. Promotion.
 - A. The Relationship Between Motivation and Promotion.
 - B. Promotion Practices.
 - C. Interviewing and Assessment Practices.
- VI. Training and Education.
 - A. Training and Education as Personnel Management Functions.
 - B. Standards and Training.
 - C. Training Required Under Federal and State Law.

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- D. Technical Training.
 - E. Training Program Components.
 - F. Higher Education (College Level).
- VII. Performance Measurement Objectives.
- A. Job.
 - 1. Documentation.
 - 2. Description and Specifications.
 - 3. Performance Standards.
 - 4. Evaluation.
- VIII. Discipline.
- A. Purpose.
 - B. Types.
 - C. Application.
 - D. Due Process.
 - E. Appeals and Grievances.
- IX. Organizational Productivity.
- A. Concept of Productivity.
 - B. System Analysis.
 - C. Indicators.
 - D. Resource Allocation.
 - E. Improvement.
- X. Compensation and Benefits.
- A. Developing the Compensation Package.
 - B. Mandatory Fringe Benefits.
 - C. Fair Labor Standards Act.
 - D. Shift Scheduling.
- XI. Employee and Labor Relations.
- A. Defining "Management."
 - B. Trends.
 - 1. Organizational Trends.
 - 2. Societal Trends.
 - C. Policy Development Labor Relations in Volunteer and Nonunionized Departments.
- XII. Collective Bargaining and the Labor Agreement.
- A. The Negotiating Process.
 - B. Typical Contract Categories.
- XIII. Contemporary Issues and Trends in Managing People and Programs.
- A. An Era of Human and Individual Rights.
 - B. Trends in Managing People.

Fire and Emergency Services Administration (C0271)

Course description

This course is designed to be a progressive primer for students who want more knowledge about fire and emergency services administration. The course demonstrates the importance of the following skills that are necessary to manage and lead a fire and emergency services department through the challenges and changes of the 21st century: persuasion and influence, accountable budgeting, anticipation of challenges and the need for change, and using specific management tools for analyzing and solving problems. A central part of the course focuses on how the leadership of a fire and emergency services department develops internal and external cooperation to create a coordinated approach to achieving the department's mission.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Define and discuss the elements of effective departmental organization.
2. Classify what training and skills are needed to establish departmental organization.
3. Analyze the value of a community-related approach to risk reduction.
4. Outline the priorities of a budget-planning document while anticipating the diverse needs of a community.
5. Assess the importance of positively influencing community leaders by demonstrating effective leadership.
6. Analyze the concept of change and the need to be aware of future trends in fire management.
7. Report on the importance of communications technology, fire service networks and the internet when conducting problem-solving analysis and managing trends.
8. Develop a clear understanding of the national assessment models and their respective approaches to certification.

Course objectives

Module I: Leading and Managing Purposefully with a Community Approach

After completing this module, you will be able to:

1. Describe the role of the fire/emergency medical services department as a part of the community government and comprehensive plan.
2. Explain the importance of a good working relationship with public officials and the community as a whole.
3. Assess ways to develop a good working relationship with public officials and the community.

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4. Identify local, state and national organizations that will be beneficial to your department.
 5. Describe how to take a proactive role in local, state and national organizations.
 6. Identify effective skills for developing a cooperative relationship with fire and emergency services personnel, as well as public officials and the general public.

Module II: Core Administrative Skills

After completing this module, you will be able to:

1. Identify the core skills essential to administrative success.
2. Describe the integrated management of financial, human, facilities, and equipment and information resources.
3. Explain the importance of public access to government operations.
4. Describe the key elements of successful communication.
5. Recognize the basic management theory in use in your agency.
6. Recognize the formal and informal dynamics of public organizations, and describe strategies to ensure success.
7. Discuss the components and styles of leadership.
8. Identify and discuss a practical agency evaluation process.

Module III: Planning and Implementation

After completing this module, you will be able to:

1. Describe the process of consensus-building.
2. Describe the components of project planning.
3. Identify the steps of the planning cycle.
4. Discuss how an environmental assessment determines the strategic issues and direction of an organization.
5. Assess the interrelationship between budgeting, operational plans and strategic plans.
6. Analyze the importance of an organizational culture and mission in the development of a strategic plan.
7. Describe the purpose, function, and current and future security concerns of working document publication, storage and integrity.
8. Explain how a fire and emergency service administrator creates a vision of the future for their organization.

Module IV: Leading Change

After completing this module, you will be able to:

1. Describe the importance of accepting and managing change within the fire and emergency service department.
2. Identify models of change commonly used in organizations.
3. Summarize the steps of the change management process.
4. Assess ways to create a positive climate for change, and introduce new ideas within the organization.
5. Describe how an organization can respond to current or emerging events or trends.
6. Explain the benefits of employee involvement in departmental decisions.
7. Demonstrate innovative ways to address traditional problems within the organization.
8. Describe ways to increase and reward professional development efforts.

Module V: CRM — A 21st Century FESA Responsibility

After completing this module, you will be able to:

1. Assess the importance of integrating fire and emergency services into a community's comprehensive plan.
2. Assess your organization's capabilities and needs based on risk analysis probabilities.
3. Describe the relationship between community risk analysis and strategic and operational planning.
4. Identify the major steps of a community risk assessment.
5. Identify direct and indirect costs associated with fire.
6. Analyze economic incentives that encourage and discourage fire prevention.
7. Describe the role of fire and emergency services in the economic development and neighborhood preservation programs of the community.

Available texts

Bruegman, R. R. (2012). *Advanced fire administration*. Pearson. ISBN-10: 0-13-282438-8; ISBN-13: 978-0-13-282438-5. <http://bradybooks.com/store/product.aspx?isbn=0132824388>

Buckman, J. M., III (Ed.). (2006). *Chief fire officer's desk reference*. Jones & Bartlett Publishers. ISBN: 9780763729356.

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Course outline

- I. A Community Approach to Fire Administration.
 - A. Political Considerations.
 - B. Persuasion and Influence.
 - C. Followership.
- II. Core Skills Required of a Modern Fire Administrator.
 - A. Resource Management.
 - B. Communication and Public Access.
 - C. Organization.
 - D. Management Dynamics.
- III. Planning, Decision-making and Implementation.
 - A. Decision-making Strategies and Methods.
 - B. Building Consensus.
 - C. Policy Development and Implementation.
 - D. Project Management.
 - E. Strategic Planning.
 - F. Operational Planning.
 - G. Documentation.
- IV. Leading Change.
 - A. Change Management.
 - B. Social and Cultural Considerations for Change.
 - C. Implementing External Mandates.
 - D. Planning for a Sustainable Organization.
 - E. Professional Development.
 - F. Anticipating Change.
- V. Community Risk Management.
 - A. Role of the Fire Department in Community Risk Dynamics.
 - B. Risk Assessment and Planning.
 - C. Economic Development and Emergency Planning.

Community Risk Reduction for the Fire and Emergency Services (C0287)

Course description

This course provides a theoretical framework for the understanding of the ethical, sociological, organizational, political and legal components of community risk reduction, and a methodology for the development of a comprehensive community risk-reduction plan.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Identify ways to become champions of risk reduction.
2. Develop and meet community risk-reduction objectives.
3. Identify and develop intervention strategies.
4. Implement a risk-reduction program.
5. Review and modify risk-reduction programs.

Course objectives

Module I: Introduction to Community Risk Reduction and the Fire Service

After completing this module, you will be able to:

1. Define and understand community risk and community risk reduction.
2. Evaluate the benefits and challenges of community risk reduction.
3. Analyze the fire and emergency service departments' and officer's role in community risk reduction.
4. Develop a personal vision statement for community risk reduction in your community.
5. Establish your community risk-reduction planning processes.

Module II: Develop and Meet Risk Reduction Objectives

After completing this module, you will be able to:

1. Gain a thorough knowledge of your community by conducting a community inventory.
2. Identify hazards and assess your community's vulnerability.
3. Define levels of risk acceptable to your community.
4. Assess the risks and establish risk-reduction priorities.
5. Create your risk-reduction objectives.

Module III: Identify and Develop Intervention Strategies

After completing this module, you will be able to:

1. Identify potential risk-reduction strategies.
2. Analyze cost versus benefit to determine a plan of action for your community risk-reduction plan.
3. Select realistic and achievable risk-reduction strategies.
4. Develop an intervention strategy.

Module IV: Implement a Risk Reduction Program

After completing this module, you will be able to:

1. Identify and locate needed resources for a community risk-reduction plan.
2. Develop a risk-reduction implementation schedule.
3. Assign roles and responsibilities within the risk-reduction team.
4. Create your community risk-reduction action plan.

Module V: Review, Modify and Market Risk Reduction Programs

After completing this module, you will be able to:

1. Develop a risk-reduction evaluation strategy.
2. Review and evaluate results of the evaluation process.
3. Modify your risk-reduction initiatives.
4. Develop a marketing/dissemination plan.
5. Finalize the executive summary of your risk reduction plan.

Available texts

Bruhn, J. G. (2011). *The sociology of community connections* (2nd ed.). Springer. ISBN: 978-94-007-1632-2. <https://link.springer.com/book/10.1007/978-94-007-1633-9#about>

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Additional resources

Giesler, M. P. (2011). *Fire and life safety educator*. Delmar, Cengage Learning.

Course outline

- I. Sociology of the Community.
 - A. Psycho-social and Historical Aspects of "Community."
 - B. Community Types.
 - C. Community Systems.
 - D. Classifying Communities.
- II. The Changing Nature of the Fire Threat.
 - A. Response Considerations.
 - 1. Fire.
 - 2. Prevention.
 - 3. EMS.
 - 4. Hazardous Materials.
 - 5. The Urban Interface.
 - B. Resource Organizations.
- III. Fire Service Relations and Community Dynamics.
 - A. The Cost of Fire.
 - B. Community Diversity.
 - C. Fire Service Relationship with Non-emergency Community Agencies.
 - D. Economic Development and Partnerships.
- IV. The Community Inventory.
 - A. Demographic Resources.
- V. Community Needs Assessment.
 - A. Survey, Interviews, Questionnaires.
- VI. Meeting the Community Fire Threat.
 - A. Rural Fire Hazards and Threats.
 - B. The Metro Fire Problem.
 - C. The Role of Local Government.
 - D. The Emergency Operations Center (EOC).
- VII. Types of Delivery Systems.
 - A. Related Services.
- VIII. Fire Service Relationships with Other Community Agencies.
 - A. Federal Emergency Management Agency (FEMA).
 - B. U.S. Fire Administration (USFA).
 - C. Incident Command/Management Systems.
- IX. The Incident Command System.
 - A. History of Incident Command System (ICS).
 - B. ICS Dynamics and Structure.

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- X. Adversarial Relationships Within the Community.
 - A. Sources of Conflict.
 - B. Conflict Resolution.
 - 1. Negotiation and Decision-making.
 - 2. Evaluating Alternatives.
 - XI. Rethinking the Fire Department Mission.
 - A. Changing Community Elements that Define the Mission.
 - B. Creating a New Mission Statement.
 - C. Defining Impact Objectives.
 - D. Program Objectives.
 - E. Quality Control.
 - XII. Shaping Community Policy.
 - A. The Fire Department and Community Interaction.
 - XIII. Master Planning for Community Protection.
 - A. Origins of Master Planning.
 - B. Dynamics of Master Planning.
 - C. The Strategic Planning Model.
 - 1. 12 Steps of Master Planning.
 - XIV. Shaping Community Perceptions of the Local Fire Service.
 - A. Marketing and Public Relations.

Fire Service Ethics (C0303)

Course description

This course examines the basic principles of ethics as related to fire service operations and management with special attention given to current issues in the fire service.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Develop a value statement for your department.
2. Devise and implement an ethics training program for your department.
3. Review and revise minority recruitment strategies.

Course objectives

Upon completion of this course, you will be able to:

1. Identify what the term ethics means and why it is important to the fire service.
2. Distinguish between social norms, morality, ethics and the law.
3. Compare and contrast the concepts of values, beliefs and attitudes.
4. Explore how the concepts of accountability, obligation and responsibility define ethical behavior.
5. Contrast modern and classical philosophy of ethical study as they relate to the fire service.
6. Contrast and compare fire service ethics standards and guidelines.
7. Review a firefighter's professional obligations and responsibilities.
8. Appraise the ethical responsibilities associated with leadership.
9. Evaluate current issues in fire service ethics.
10. Identify the values of a diverse workplace.
11. Identify benefits, hindrances and tactics related to achieving diversity.
12. Compare and contrast internal versus external ethical control systems.
13. Review the principles of integrity-based management programs.
14. Apply relevant state and federal ethics laws to fire service administration.
15. Appraise various influences on ethical decision-making.
16. Evaluate tactics for implementing an ethical culture.
17. Explore best practices in building an ethical culture.

Available text

Walker, H. S. (2020). *Fire service ethics*. Jones & Bartlett Learning. ISBN: 9781284171655.
<https://www.psglearning.com/fire/science/productdetails/9781284171655>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Point of contact

H. Scott Walker, Western Illinois University (309-298-2625)
Email: hs-walker@wiu.edu

Course outline

Section I — Foundational Studies

- I. Introduction.
 - A. What Is Ethics?
 - B. Why Study Ethics?
 - C. Why Be Ethical?
 - D. Why Is Ethics of Value to the Fire Service?
- II. Understanding Ethics.
 - A. Social Norms.
 1. Norms.
 2. Folkways.
 3. Mores.
 4. Taboos.
 - B. Morality.
 1. What Is It?
 2. Where Does It Come From?
 - C. Ethics.
 1. How Do They Differ From Morals?
 2. How Are Ethics Determined?
 3. Professional Versus Personal Ethics.
 - D. Law
 1. *Mallum in Se* and *Mallum Prohibitum*.
 2. Law and Ethics.
 3. Law and Morality.
 - E. The Role of Religion.
 1. Religion and Morality.
 2. Religion and Free Will.
- III. Behavior Influences.
 - A. Values.
 - B. Beliefs.
 - C. Attitudes.
 - D. Distinguishing Needs and Wants.

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- E. The Role of Responsibility.
 - 1. Subjective Responsibility.
 - 2. Objective Responsibility.
 - F. Integration of Behavior.
- IV. Ethics and Philosophy.
- A. Validity.
 - B. Normative Ethics.
 - 1. Utilitarianism.
 - 2. Deontology.
 - C. Virtue Ethics.
 - D. Constructivism.
 - 1. Benefice Ethics.
 - 2. Egoism.
 - E. Social Contracts.
 - F. Subjectivism.
 - G. Meta-ethics.

Section II — Ethics in the Fire House

- V. Professional Ethics Within the Fire Service.
- A. Are We a Profession or a Job?
 - B. Professional Standards.
 - C. Firefighter Code of Ethics.
 - D. The Importance of Character.
- VI. Firefighter's Responsibility.
- A. Fire Service Values.
 - 1. Duty.
 - 2. Compassion.
 - 3. Honesty.
 - 4. Teamwork.
 - 5. Competency
 - 6. Bravery.
 - 7. Loyalty — Thin Red Line.
 - B. Objective Responsibilities.
 - 1. Department Policy.
 - 2. Competency.
 - 3. Safety.
 - C. Honoring Trust.
 - 1. Privacy.
 - 2. HIPAA.
 - 3. Gossip.
 - D. Subjective Responsibility.
 - 1. Personal Values.
 - 2. Career Ambition.
 - 3. Tradition.
 - 4. Balancing Home Life with Work Life.
 - E. Benefice Ethics and Contact Theory Applied to Emergency Response.

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- VII. Ethics and Leadership.
 - A. Ethics and Company Officers.
 - 1. Enforcing Policy.
 - 2. Modeling Behavior.
 - B. Duty.
 - 1. Duty to Teach.
 - 2. Duty to Superiors.
 - 3. Duty to Subordinates.
 - C. Balancing Leadership.
 - 1. Unions and Management.
 - D. Servant Leadership.

- VIII. Contemporary Issues.
 - A. Privacy.
 - B. Off-Duty Activity.
 - C. Pay per Spray.
 - D. Social Media.
 - E. Politics.
 - F. On-the-Job Relationships.
 - G. Harassment.
 - H. Use of Internet.

- IX. Diversity.
 - A. What Is Diversity?
 - 1. Value in Diversity.
 - 2. Organizational Adaptation.
 - 3. The Ethics of Workplace Fairness.
 - B. Recruitment and Hiring.
 - 1. Legal Issues.
 - 2. The Ethics of Affirmative Action.
 - 3. The Ethics of Quotas.
 - C. Promotions.
 - D. Women's Issues in the Fire Service.
 - E. Hostility in the Workplace.

Section III — Administrative Ethics

- X. Managing Ethics.
 - A. External Governance.
 - 1. Herman Finer.
 - 2. The Role of Policy in Ethics.
 - B. Internal Governance.
 - 1. Carl J. Friedrich.
 - C. Bounded and Unbounded Ethical Systems.
 - D. Compliance-Based Versus Integrity-Based Systems.
 - 1. What Are Compliance-Based Ethical Controls?
 - 2. What Are Integrity-Based Controls?
 - 3. Limits of Each Control System.
 - 4. Results of Each System.

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- E. Organization Structure and Ethics.
 - 1. Scalar Structure.
 - 2. Flat Structure.
 - XI. Leading an Ethical Culture.
 - A. Unbounded Ethics.
 - B. Building an Ethical Culture.
 - 1. The Role Value-Based Leadership.
 - 2. Testing for Ethics.
 - C. Maintaining an Ethical Culture.
 - 1. Modeling Ethics.
 - 2. Training in Ethics.
 - 3. Ethics Within Training.
 - 4. Continuity of Values Through Chain of Command.
 - XII. Fire Service Ethics and the Law.
 - A. Ethical Conflicts.
 - 1. Conflict of Interest.
 - 2. Conflict of Authority.
 - 3. Conflict of Roles.
 - 4. Quid Pro Quo.
 - B. Social Ethical Controls.
 - 1. Equal Opportunity.
 - 2. Sexual Harassment.
 - 3. Diversity.
 - 4. ADA Rules.
 - C. Financial Ethical Controls.
 - 1. Accounting Practices.
 - 2. Bidding and Purchasing.
 - 3. Appropriation of Funds.
 - D. Ethics of Confidentiality.
 - 1. HIPAA.
 - 2. Trade Secrets.
 - 3. Personnel Records.
 - E. Ethics and Transparency.
 - 1. Freedom of Information.
 - 2. Open Meetings Acts.
 - 3. Reporting Requirements.
 - 4. Record Keeping and Disposal.
 - a. Email and Correspondence.
 - 5. Whistle Blowers.

Section IV — Applied Ethics

- XIII. Ethical Decision-Making.
 - A. Levels of Ethical Reflection.
 - 1. Morals Rules Level.
 - 2. Ethical Analysis.
 - 3. Post Ethical Analysis.
 - 4. Descriptive Models.

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- B. Conscience or Obligation?
 - 1. Moral Imperatives.
 - 2. Fiduciary Responsibility.
 - C. Outcome Versus Process.
 - D. Loci of Control.
- XIV. Moral Disengagement.
- A. Moral Disengagement.
 - 1. Rationalization.
 - 2. Context.
 - 3. Priority Confusion.
- XV. A Strategic View of Fire Service Ethics.
- A. Ethics Challenges Facing the Fire Service.
 - B. Adapting to 21st Century Realities.
 - C. Developing Professional Standards.
 - D. Ethics Within Professional Development.

Bachelor's (Non-Core)

Fire Dynamics (C0257)

Course description

This course examines the underlying principles involved in structural fire protection systems and building furnishings, as well as fire protection systems, including water-based fire suppressions systems, fire alarm and detection systems, special hazard suppression systems, and smoke management systems.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Analyze building structural components for fire endurance and fire resistance.
2. Understand the flame spread and smoke production properties of building furnishings and materials.
3. Understand the importance of, and be able to calculate, heat release rate for combustibles.

Course objectives

Module I: Definition, Units, Fire Tetrahedron, Heat Transfer, Heat of Combustion, Ideal Gas Law

After completing this module, you will be able to:

1. Understand the definition and history of fire dynamics.
2. Review examples of fire incidents.
3. Become proficient in using SI units and converting between units.
4. Understand the fire tetrahedron.
5. Know the difference between diffusion flames and premixed flames.
6. Classify the 3 modes of heat transfer and describe their relevance to fires.
7. Solve simple heat transfer problems.
8. Understand the principles of heats of combustion.
9. Solve elementary problems involving the Ideal Gas Law.

Module II: Ignition and Flame Spread of Materials

After completing this module, you will be able to:

1. Describe the ignition and fire growth process given a specific fuel type and form.
2. Explain the process of flame spread in liquid fuels, and calculate the burning rate for a liquid fuel fire.
3. Explain the process of flame spread over a solid fuel, and list variables that affect flame spread rate.
4. Predict ignition times for various fuels.

Module III: Plumes

After completing this module, you will be able to:

1. Calculate flame height.
2. Calculate the thermal radiation from a flame.
3. Define the structure of buoyant plumes and ceiling jets.
4. Calculate the temperature, velocity and mass flow rate of a fire plume.
5. Predict a fire's heat release rate using the time squared method.
6. Explain the impact of walls and corners on flames and plumes.
7. Estimate operation time of sprinklers and heat detectors.
8. Estimate the heat release rate needed for flashover.

Module IV: Smoke

After completing this module, you will be able to:

1. Define smoke.
2. Understand the dangers of smoke.
3. Describe the effects of visibility in smoke, and calculate viewing distance in smoke.
4. Discuss the toxicity of smoke.
5. Explain how stack effect controls the movement of smoke.
6. Understand the various methods of controlling smoke.
7. Estimate the amount of smoke produced by a fire.
8. Calculate the filling rate of smoke in a space.

Module V: Explosions

After completing this module, you will be able to:

1. Discriminate between deflagrations and detonations.
2. Classify three types of explosions.
3. Relate blast effects and overpressure to property damage and life safety.
4. Differentiate between a BLEVE and an UVCE.
5. Explain the fire and explosion potential in concentrated dust environments.
6. Calculate the TNT equivalent of a given amount of material.
7. Relate TNT equivalence to overpressure.
8. Relate overpressure to damage.

Available texts

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Drysdale, D. (2011). *An introduction to fire dynamics* (3rd ed.). Wiley. ISBN: 9780470319031. <http://www.wiley.com/WileyCDA/WileyTitle/productCd-EHEP002263.html>

Friedman, R. (1998). *Principles of fire protection chemistry and physics* (3rd ed.). National Fire Protection Association. ISBN: 0-87765-440-9. <http://www.nfpa.org/>

Gorbett, G. E., and Pharr, J. L. (2011). *Fire dynamics*. Pearson.

Course outline

- I. Introduction.
 - A. Basic Dynamics of Fire.
 1. Heat Transfer.
 2. Flame.
 3. Flashover.
 - B. Mathematics Review.
- II. Chemistry, Physics and Fluid Dynamics.
 - A. Working With Chemical and Physical/Kinetic Calculations.
 1. Stoichiometry.
 2. Heat Transfer.
 3. Measurement Tools and Resources.
 4. Fluid Dynamics.
- III. Fire and Combustion.
 - A. Flame Dynamics.
 - B. Calorimetry.

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- IV. Explosions.
 - A. Definitions.
 - B. Deflagration and Detonation Calculations.
 - C. Enclosed Explosions.
 - V. Ignition and Flame Spread.
 - A. Liquid and Solid Fuels Ignition.
 - B. Liquid Flame Spread.
 - C. Solid Flame Spread.
 - VI. Plumes.
 - A. Flame Height.
 - B. Radiation.
 - C. Velocity.
 - D. Ceiling Jets.
 - VII. Flashover and Compartment Fires.
 - A. Combustion Phases.
 - B. Smoke.
 - C. Energy Release and Pressure Calculations.
 - D. Backdraft.
 - VIII. Post-flashover Fires.
 - A. Energy Release and Temperatures.
 - IX. Smoke Movement.
 - A. Smoke Definition and Production.
 - B. Toxicity.
 - C. Stack Effect.
 - D. Venting and Smoke Control.
 - X. Fire Suppression.
 - A. Extinguishment Mechanisms.
 - XI. Fire Dynamics Applications to Building Codes and Large-Loss Fires.
 - A. Hillhaven Nursing Home Fire.
 - B. DuPont Plaza Hotel Fire.
 - C. First Interstate Bank Fire.
 - D. Fire Dynamics in Building Codes and Fire Safety Standards.
 - XII. Fire Dynamics and Special Hazards.
 - A. Spontaneous Combustion.
 - B. Oxygen Enriched Environments.
 - C. Shipboard and Metal Wall Fires.
 - D. Wildland Fires.
 - E. Wind-driven Fires.
 - XIII. Fire Modeling and Trends in Fire Dynamics.
 - A. Model Types.
 - B. Trends.

Fire Related Human Behavior (C0263)

Course description

This course presents a study of human behavior in fire and other emergency situations. Students will examine current and past research on human behavior, systems models, life safety education and building design to determine the interactions of these areas in emergency situations. Students will develop an understanding of a best-practice building life safety system as one that combines knowledge in the areas of psychology and sociology, joined with engineering and education to produce the best possible outcomes in terms of human survivability in an emergency.

Prerequisites

None.

Course outcomes

Upon completion of the course, you will be able to:

1. Apply knowledge to create a system that integrates human behavior factors into life safety planning and practice.
2. Understand how psychology and sociology factors influence behavior.
3. Demonstrate how current computer systems modeling functions.
4. Locate and analyze current human-related fire research.

Course objectives

Module 1: Fire and Human Behavior

After completing this module, you will be able to:

1. Describe the history of fire-related human behavior as a field of study.
2. Explain common behavioral factors in response to fire and emergencies, and specify misconceptions about human behavior in a fire emergency.
3. Identify systems and the interrelationship of people and buildings as a system.
4. Explain the importance of studying fire-related human behavior as a method of reducing accidental death and injury.

Module 2: Factors Influencing Behavior

After completing this module, you will be able to:

1. Analyze how specific occupant characteristics relate to behavior.
2. Explain how group dynamics affect decision-making.
3. Describe specific examples of how training (fire drills) and the built environment affect behaviors.
4. Explain how the built environment and human behavior are interdependent.

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5. Explain factors that influence how a threat is perceived, as well as risk perception and decision-making factors that affect behavior, especially as they relate to alarms.
 6. Explain how remote risks and action schemas influence risk perception and decision-making.
 7. Assess how the occupancy category affects behaviors, and explain why people are more likely to die from a fire in their home than anywhere else.
 8. Compare and contrast historical fires with more current fires to determine changes that have occurred.

Module 3: Research and Design

After completing this module, you will be able to:

1. Describe various scientific methods for conducting fire-related social research, and explain how each is best applied to specific avenues of inquiry.
2. Demonstrate the ability to locate and use current research.
3. Distinguish good research from persuasive techniques and spurious research, online and on paper.
4. Give examples of 2 computer models that use information about building occupants to help predict overall systems (building) performance during fires.
5. Explain the logical basis for goal decomposition, and list 3 goal-based systems approaches that use this technique.
6. Describe the 2 ways in which hard and soft systems approaches differ and how these differences make the various types of models more useful or less useful.
7. List 2 sources of assumptions used in the current method for calculating exit capacities in the model codes, and explain why a simple linear model of exit capacities is less valid than the effective width model; state how researchers discovered its inaccuracy.
8. Compare and contrast current modeling systems, and explain their positive and negative features.

Module 4: Integrating Design and Behavior

After completing this module, you will be able to:

1. Assess how the characteristics of the physical setting in which a fire occurs may influence how people respond to the emergency.
2. Identify the 3 features of building exits that are important from a human behavior standpoint.
3. Explain 3 examples of how human behavior can negate the effects of warning and fire suppression systems.
4. Describe 2 methods of reducing crowding situations during emergency egress.

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5. Correctly rank the effectiveness of floor plans, signs and verbal instructions in helping people find their way around buildings, and explain why these approaches fall into this order of effectiveness.
 6. Describe the false alarm effect, and identify 5 steps to lessen the effect.
 7. Explain how task persistence can jeopardize life safety.
 8. Differentiate between active errors and latent errors.
 9. Explain the interaction and interdependence of environment and behavior.
 10. Describe potential problems associated with protecting people with disabilities during fire emergencies.
 11. Describe at least 2 human behavioral issues associated with the use of elevators to evacuate people from large, multistory buildings.

Module 5: Toward Integrated Systems

After completing this module, you will be able to:

1. Differentiate between performance and prescriptive codes and explain the benefits and drawbacks of each.
2. Discuss industry goals for the future that are informed by behavioral science.
3. Develop a model system that integrates human behavior factors into life-safety planning and practice.
4. Demonstrate synthesis of learning over this course by drawing conclusions based on material studied and applying knowledge to practical and realistic tasks.

Available text

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Additional resources

Badger, S. G. (2005). *Catastrophic multiple-death fires in the United States*. National Fire Protection Association.

Benichou, N., & Hadjisophocleous, G. V. (2001, Winter). Development of performance-based codes, performance criteria and fire safety engineering methods. *International Journal on Engineering Performance-Based Fire Codes*, 2(4): 127-142.

Bryan, J. L. (2002, Fall). A selected historical review of human behavior in fire. *Fire Protection Engineering*, 16, 4-10.

Bukowski, R. W. (2005, December). Applying the lessons of September 11, 2001 to the built environment. *Australian Building Regulation Bulletin*.

Consulting-Specifying Engineer staff. (2003, March). Disasters offer lessons for future. *Consulting-Specifying Engineer*, 33(3).

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- Drabek, T. E. (2007). Sociology, disasters and emergency management: History, contributions, and future agenda. In D. A. McEntire (Ed.), *Disciplines, disasters and emergency management: The convergence and divergence of concepts, issues and trends in the research literature*. Charles C Thomas Publisher.
- Duval, R. F. (2006). *NFPA case study: Nightclub fires*. National Fire Protection Association.
- Evarts, B. (2011). *Human factors contributing to fatal injury* [Executive Summary].
- Evarts, B. (2011). *Structure fires in dormitories, fraternities, sororities, and barracks*. National Fire Protection Association.
- Fahy, R. F., & Proulx, G. (1997). *Human behavior in the World Trade Center evacuation* [Publication]. National Institute of Standards and Technology.
- Fahy, R. F., & Proulx, G. (2002). *A comparison of the 1993 and 2001 evacuations at the World Trade Center*. National Research Council Canada.
- Fischer, H. W., Stine, G. F., Stoker, B. L., & Trowbridge, M. L. (1995). Evacuation behavior: Why do some evacuate, while others do not? A case study of the Ephrata, Pennsylvania (USA) evacuation. *Disaster Prevention and Management* 4(4): 30–36. doi: 10.1108/09653569510093414
- Groner, N. E. (1985, September). Life safety strategies: How a building's designers and users can work together to reduce the risk of death and injury during a fire. *Fire Journal*, 79(5): 27–30.
- Groner, N. E. (2002, October). A compelling case for emergency elevator systems. *Fire Engineering*, 155(10).
- Groner, N.E. (2004). User centered design can produce safer and more cost effective buildings by supporting the adaptive responses of emergency teams and occupants. *Proceedings of the 3rd International Symposium on Human Behavior in Fire*. Interscience Communications.
- Hoover, A. (2015, November 28). The worst nightclub fire in history happened 73 years ago in Boston. *The Boston Globe*. <https://www.boston.com/news/history/2015/11/28/the-worst-nightclub-fire-in-history-happened-73-years-ago-in-boston>
- Jones, B. K., & Pauls, J. L. (1980). Research in human behavior. *Fire Journal*, 74(3): 35–41.
- Kuligowski, E. D. (2005). *Review of 28 egress models* [Report no. 1032]. National Institute of Standards and Technology.
- Kuligowski, E. D. (2008). *Modeling human behavior during building fires* [Report no. 1619]. National Institute of Standards and Technology.
- Kuligowski, E. D. (2009). *The process of human behavior in fires* [Report no. 1632]. National Institute of Standards and Technology.
- Lee, A., Midgett, J., & White, S. (2004). *A review of the sound effectiveness of residential smoke alarms* [Report no. CPSC-ES-0502]. U.S. Consumer Product Safety Commission.

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- Libby, R. J., & Evenson, J. M. (2012, May). Designing an effective emergency communication system. *Consulting-Specifying Engineer*.
- Marsar, S. (2010, July). Survivability profiling: How long can victims survive in a fire? *Fire Engineering*, 163(7): 77–82.
- Murphy, S. (2002, September-October). The human factor. *NFPA Journal*, 96(5): 54–60.
- National Fire Protection Association. (1996). *Fire investigation summary: Chapel Hill, NC Fraternity House Fire, May 12, 1996* [Report].
- National Research Council. (2003). *Making the nation safe from fire: A path forward in research*. National Academies Press.
- O'Connor, D. J. (2005, Fall). Integrating human behavior factors into design. *Fire Protection Engineering*, 28, 8–20.
- Peacock, R. D., & Kuligowski, E. D. (2010). *Building occupant egress data*. National Institute of Standards and Technology.
- Pires, T. T. (2005, March). An approach for modeling human cognitive behavior in evacuation models. *Fire Safety Journal*, 40(2): 177–189.
- Proulx, G. (2000). *Strategies for ensuring appropriate occupant response to fire alarm signals*. Institute for Research in Construction.
- Proulx, G. (2000). *Why building occupants ignore fire alarms*. Institute for Research in Construction.
- Public/Private Fire Safety Council. (2006). *Home smoke alarms and other fire detection and alarm equipment* [White paper]. <http://www.staugustafd.org/pdf/SmokeAlarmsWhitePaper0406.pdf>
- Society of Fire Protection Engineers. (2003). *Human behavior in fire*.
- U.S. Fire Administration, National Fire Data Center. (2003, July). Establishing a relationship between alcohol and casualties of fire. *Topical Fire Research Series*, 3(3).
- Winerman, L. (2004, September). Fighting fire with psychology. *Monitor on Psychology*, 35(8): 28–30.
- Yamada, T., & Akizuki, Y. (2016). Visibility and human behavior in fire smoke. In Hurley, M. J. et al. (Eds.), *SFPE Handbook of Fire Protection Engineering*. Springer.
- Yung, D. T., Proulx, G., Benichou, N. (2001). *Comparison of model predictions and actual experience of occupant response and evacuation in two highrise apartment building fires*. National Research Council Canada.

Course outline

- I. History and Scope of the Problem.
- II. Research.
 - A. Methods.

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- III. Systems Models.
 - A. Computer Modeling.
 - B. Goal-Based Approaches.
 - C. Sociological Approach vs. Engineering Approach.

 - IV. Case-Based Learning.
 - A. Scenario: Single Family Residential Dwelling.
 - 1. Socioeconomic Factors Influencing Fire-Related Human Behavior.
 - 2. Gender Differences.
 - 3. Consequences and Risk Perception.
 - B. Scenario: Wildland/Rural Fire.
 - 1. Challenges Presented in Wildland Fire.
 - 2. Threat Recognition.
 - C. Decision-Making.
 - D. Taking Action.
 - E. Psychological Effects on Firefighters.
 - F. Physical Reaction to Stress.
 - G. Scenario: Board-and-Care Home Fire.
 - 1. Socioeconomic Factors that Influence Fire Risk Decisions.
 - 2. Role Conflicts.
 - 3. Familiarity With Routes of Escape.
 - 4. The Building System.
 - H. Scenario: Commercial/Industrial Fire.
 - 1. Motives of Arson.
 - 2. Characteristics of Group Response to Fire.
 - 3. Characteristics of the Physical Setting.
 - 4. Interpreting Alarm Signals.
 - I. The Content of Codes.
 - 1. Assumptions About Human Behavior that Effect Code Provisions.
 - J. Code Enforcement.
 - K. Scenario: Multi-Use Occupancy (High-Rise) Fire.
 - 1. Errors: Active vs. Latent.
 - 2. The "Myth" of Panic.
 - 3. Hollywood and Flashover.
 - 4. Role Behaviors During a Fire.
 - 5. Evacuation Delays and Difficulties.
 - 6. Problems.
 - a. False and Nuisance Alarms.
 - b. Fire Alarm Fatigue.
 - c. Occupants not Awakened by the Smell of Smoke.
 - d. Ambiguity of Information.
 - e. Crowding: Egress Design Issues.
 - f. Convergence Clusters.
 - g. Disabled Persons.

 - V. Egress Behavior.
 - A. Hazard Perception.
 - B. Misrecognized Clues.

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- C. Task Persistence.
 - D. Positive Behaviors.
- VI. Alcohol.
- A. Perception of Safety.
 - B. Overconfidence.
- VII. Survivability — Why Do Some Survive.
- VIII. Incorporating Human Behavior into Life Safety Systems — The 3 E's Fire Safety through Environmental Design.
- IX. 911 Was a Success?!?
- X. Security vs. Fire Safety — Managing Large Crowds.
- XI. Computerized Evacuation Modeling — Improving Evacuation Modeling.
- XII. Prescriptive Codes vs. Performance-Based Codes.
- A. Behavioral Economics.
- XIII. Sociology of Disasters.
- A. Crowd Behavior.
 - B. "Sensemaking."
 - C. Community Resilience and Learned Helplessness.

Analytical Approaches to Public Fire Protection (C0265)

Course description

This course examines the tools and techniques of rational decision-making in fire and emergency services agencies, including data collection, statistics, probability, decision analysis, utility modeling, resource allocation and cost-benefit analysis.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Discuss the uses of analytical approaches to rational decision-making.
2. Differentiate techniques of analysis.
3. Select appropriate analytic tools to support critical thinking.
4. Discuss how the use of databases, histograms, inferential statistics and probabilities, and GIS are used in fire station location planning.
5. Apply the 5-step cost-benefit analysis process to justify essential budgetary needs.
6. Use linear programming to solve fire department equipment, revenue, facility and personnel issues.

Course objectives

Module I: Analytical Thinking, Data and Analysis

After completing this module, you will be able to:

1. Articulate the importance of rational decision-making and the analytical thinking that underlies it.
2. Given a scenario, determine which research methodology is most effective.
3. Apply critical thinking techniques to evaluate the research of others.
4. Determine the difference between data and information.
5. Identify the advantages and disadvantages of using a database.
6. Analyze the structure and use of databases.
7. Interpret graphs, frequency charts and histograms.
8. Measure the usefulness of means and standard deviations — the measures of centrality and spread.
9. Analyze database design, and develop descriptive statistics to address a range of fire and emergency services issues.

Module II: Decision Analysis

After completing this module, you will be able to:

1. Apply system analysis techniques to decision-making.
2. Compare and contrast event and decision trees and how they aid in decision analysis.
3. Apply strategic planning concepts to decision-making.

Module III: Mathematical Modeling and GIS

After completing this module, you will be able to:

1. Evaluate the functions of mathematical modeling.
2. Illustrate the benefits and limitations of using a mathematical function to model the relationship between multiple factors.
3. Demonstrate how the ISO Fire Suppression Rating Schedule is an example of utility modeling that can be used in the fire services.
4. Analyze the benefits and limitations of using a mathematical function to model the relationships between multiple factors.
5. Correlate input conditions and constraints.
6. Apply mathematical techniques to a model system in order to make reasonable predictions.
7. Evaluate how to implement GIS in an emergency service agency.
8. Apply GIS to identify and evaluate a community's risk and hazard level.

Module IV: Probability

After completing this module, you will be able to:

1. Compute probabilities of simple and compound events.
2. Apply Bayes' Theorem to decision-making situations in the fire and emergency services.
3. Determine the number of possible permutations and combinations.
4. Solve simple probability problems.

Module V: Resource Allocation and Cost-Benefit Analysis

After completing this module, you will be able to:

1. Calculate run distances, travel times and company workload using graphing techniques, hand calculations and statistical analysis.
2. Explore various automated tools available to do statistical analysis of resource allocation.
3. Assess and interpret fire station location issues and recommendations supported by analysis.

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4. Evaluate the basic assumptions of cost-benefit analyses.
 5. Examine the 5 steps of cost-benefit analysis: risk assessment, identification, data collection, calculation and analysis.

Available texts

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

U.S. Fire Administration. (2004). *Fire data analysis handbook* (2nd ed.). <https://www.usfa.fema.gov/downloads/pdf/publications/fa-266.pdf>

Course outline

- I. Definitions.
- II. Rational Decision-Making and Research Analysis.
- III. Databases.
 - A. Definition and Purpose.
- IV. Descriptive Statistics.
 - A. Graphs and Functions.
 - B. Histograms.
 - C. Standard Deviation.
 - D. Standardized Scores.
- V. Inferential Statistics.
 - A. Sampling.
 - B. Process Control.
- VI. Probability.
 - A. Approaches to Probability.
 - B. Basic Rules of Probability.
- VII. Decision Analysis.
 - A. Event Trees.
 - B. Systems Analysis.
- VIII. Mathematical Modeling.
 - A. Mathematical Modeling Processes.
- IX. Resource Allocation.
 - A. Station Location Analysis Principles.
- X. Geographical Information Systems.
 - A. Definition.
 - B. Data Resources.
 - C. Application.

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- XI. Cost-Benefit Analysis.
 - A. Definition.
 - B. The 5 Steps of Cost-Benefit Analysis.
 - XII. Linear Programming.
 - A. The Mathematics Behind Linear Programming.
 - B. Graphing Processes.

Managerial Issues in Hazardous Materials (C0274)

Course description

This course presents current issues in management of a department-wide hazardous materials program. It includes issues that are pertinent to officers and managers in public safety departments, including regulations and requirements for hazardous materials (hazmat) preparedness, response, storage, transportation, handling and use, and the emergency response to terrorism threats/incidents. Subjects covered include state, local and federal emergency response planning, personnel and training, and operational considerations, such as determining strategic goals and tactical objectives.

Prerequisites

None.

Course outcomes

Upon completion of this course, you should be able to:

1. Explain and apply local, state and federal regulations concerning hazmat.
2. Participate meaningfully in the process of planning, organizing and training for response to hazmat/terrorist incidents.
3. Interpret and act on departmental responsibility for hazmat response preparedness, incident prevention and incident response.
4. Identify and work with representatives of multiple services, levels of government and organizations in an organized incident-management structure.
5. Discuss issues pertaining to terrorism and tactical violence, including terrorism preparedness, response and planning issues.
6. Develop an incident command organizational structure for a hazmat response using the guidelines set forth in the National Incident Management System (NIMS).

Course objectives

Module 1 Introduction to Hazardous Materials

After completing this module, you will be able to:

1. Explain the correlation between trends in chemical use and emergency-release incidents.
2. Recognize and define common terms used in hazmat response and regulation.
3. Summarize the intent of major pieces of legislation and standards that affect hazmat planning and emergency response.
4. Explain the purpose of the state and local emergency-response commissions and their role in managing hazmat situations in the community.
5. Identify the federal agencies that are responsible for enacting and enforcing hazmat regulations, and explain each agency's specific area of concern.

Module 2: Community-Centered Managerial Issues

After completing this module, you will be able to:

1. List and explain the basic components of emergency planning for hazmat response and management.
2. Explain the purpose of the State Emergency Response Commission (SERC) and Local Emergency Planning Committee (LEPC) and their roles in managing hazmat.
3. Recognize the difference between protection-in-place and evacuation strategies.
4. Explain the legal basis for the requirement of using Incident Command.
5. Differentiate between public information and public education.
6. Explain the legal requirements governing public access to information.
7. Discuss current concerns about information access versus homeland security.
8. Describe the benefits of community education programs.
9. Identify at least 1 automated community information program currently in use.

Module 3: Department-Centered Managerial Issues

After completing this module, you will be able to:

1. Compare the similarities and critical differences between a “normal” fire emergency and a hazmat emergency.
2. Describe the capabilities and limitations of first responders with regard to equipment, protective clothing, training and experience.
3. Explain the training and emergency response requirements mandated in regulation 29 CFR 1910.120(q) and compare them to NFPA 472, *Standard for Competence of Respondents to Hazardous/Weapons of Mass Destruction Incidents*.
4. Explain the certification-of-competency requirement and recordkeeping requirements specified in the regulations.
5. Describe regulated occupancies and activities related to hazardous materials.
6. Demonstrate methods of ascertaining code compliance for storage, handling and use of hazmat.
7. Locate applicable codes and regulations pertaining to storage, handling and use of hazmat.

Module 4: Incident-Response Managerial Issues

After completing this module, you will be able to:

1. Assess the strategic goals and tactical options for managing a hazmat incident.
2. List and describe the steps involved in the management process at a hazmat incident.

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3. Explain additional risk and response considerations for a hazmat incident that is also a terrorist incident.
 4. State the differences between a Command Post and an Emergency Operations Center.
 5. Name the different interest groups in the Command Post and explain their goals and concerns.
 6. Define the terms **recovery** and **termination**.
 7. Discuss the necessary documentation to be produced in conjunction with incident management.
 8. Explain debriefing, post-incident analysis and after-action reports.
 9. Explain the federal precedents for cost-recovery legislation.
 10. Describe the 4 phases of termination.
 11. Make response decisions based on risk analysis.

Module 5: Program Management

Available texts

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

Noll, G. G., & Hildebrand, M. S. (2014). *Hazardous materials: Managing the incident* (4th ed.). Jones & Bartlett Learning.

Additional resources

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous Materials, Health and Safety, Wildfire.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>
- 🔗 <http://www.homefiresprinkler.org>

Bryan, J. L. (March 1993). *Fire suppression and detection systems* (3rd ed.). MacMillan Publishing.

Gagnon, R. (1997). *Design of water-based fire protection systems*. Delmar, Cengage Learning.

Smith, C. A., Wieder, M., Brakhage, C. (2001). *Private fire protection and detection* (2nd ed.). International Fire Service Training Association.

SFPE: <http://www.sfpe.org/>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Preparing for the Incident.
 - A. The Hazardous Materials Incident Management System.
 - B. Health and Safety.
 - C. Incident Command.
- II. Responding to the Incident.
 - A. Site Management.
 - B. Identifying the Problem.
 - C. Hazard Assessment and Risk Evaluation.
 - D. PPE and Equipment Selection.
 - E. Information Management and Resource Coordination.
 - F. Implementing Response Objective.
 - G. Decontamination.
- III. Terminating the Incident.
 - A. Post Incident Review.
 - B. Liability Issues.

Fire Investigation and Analysis (C0285)

Course description

This course examines the technical, investigative, legal and social aspects of arson, including principles of incendiary fire analysis and detection, environmental and psychological factors of arson, legal considerations, intervention, and mitigation strategies. This course prepares the student to recognize and apply best practices in the investigation of fires, conduct the origin and cause determination procedures and practices necessary to ascertain if the fire was accidental or incendiary, prepare the investigative reports necessary to document such analysis, and apply the findings and knowledge acquired through such efforts to reduce the consequence of both accidental and intentional fires.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Demonstrate a technical understanding of the characteristics and impacts of fire loss and the crime of arson, which is necessary to conduct competent fire investigation and analysis.
2. Document the fire scene in accordance with best practice and legal requirements.
3. Analyze the fire scenario utilizing the scientific method, fire science and relevant technology.
4. Analyze the legal foundation for conducting a systematic incendiary fire investigation and case preparation.
5. Design and integrate a variety of arson-related intervention and mitigation strategies.

Course objectives

Module I: Introduction to Fire Investigation and Analysis

After completing this module, you will be able to:

1. Compare and contrast local, state or national fire data trends related to cause, property type, deaths, injuries and dollar loss as a result of both accidental fires and arson.
2. Define and properly apply the classification factors utilized to describe the 4 fire-cause determinations.
3. Assess and compare the major (USFA-NFPA) fire data collection systems, methods and analytical techniques used to quantify and qualify the nation's fire loss experience.
4. Identify and examine the major organizations with resources available to assist communities as they develop fire analysis procedures.
5. Describe the 6 motives for incendiary fire.
6. Explain other factors to consider when conducting a fire investigation, such as sociology and culture.

Module II: Origin and Cause Determination

After completing this module, you will be able to:

1. Explain the significance of using the scientific method in fire investigations and the importance of fire investigation as a science.
2. Describe how the basic steps in fire investigation relate to the sequence of events in proper scene documentation.
3. Describe the significance of preserving the fire scene and how initial observations made by first responders (fire, police, EMS) may lead to origin and cause determination.
4. Explain the functional organization and significance of the fire investigative team, including the canine detection unit, special teams, interrogation team and forensics unit.
5. Recognize and interpret fire patterns.
6. Determine the effects of fire on materials, such as glass, wood, concrete and metals.
7. Describe the major steps in a comprehensive fire investigation.
8. Compare and contrast the concepts of motive versus intent.
9. Explain the legal requirements of the investigative process.
10. Given a scenario, identify the persons who should be interviewed during an incendiary investigation.

Module III: Fire Analysis

After completing this module, you will be able to:

1. Explain the components of the fire tetrahedron and their relevance to fire investigation.
2. Differentiate between temperature and energy.
3. Describe the 3 methods of heat transfer.
4. Explain the physical, thermal and chemical properties of solid, liquid and gaseous fuels and how they are relevant to ignition and heat release rate of the fuels.
5. Identify the difference between a pre-mixed and diffusion flame.
6. Explain the process of ignition and burning of different fuel types.
7. Describe fire growth.
8. Explain the impact of fuel geometry on heat release rate.
9. Compare and contrast fire plumes and ceiling jets.
10. Describe the impact of ceilings, walls and ventilation on compartment fires.

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11. Explain the interrelationship of fuel, compartmentation, ventilation and heat release rate.
 12. Describe flashover and backdraft.
 13. Understand the different methods of fire modeling, both physical and computational methods, and how they may be used to test your hypothesis as part of the scientific method.
 14. Describe the types of standardized fire tests that are available and what material properties/characteristics can be measured.
 15. Examine the pros and cons of bench-scale fire testing versus full-scale fire testing.
 16. Describe the types of computational fire modeling available and the capabilities and limitations of each.
 17. Differentiate between probabilistic and deterministic fire models, and zone and field compartment fire models.
 18. Understand how to apply simplified fire growth calculations to the fire investigation process appropriately.

Module IV: Incendiary Fire Investigation

After completing this module, you will be able to:

1. Compare and contrast the burden of proof for civil and criminal acts.
2. Analyze the legal considerations to access the fire scene.
3. Define the crime of arson.
4. Explain how the provisions of the Fourth Amendment condition a fire investigator's access to the scene.
5. Define the constitutional limits involving the privilege against self-incrimination and the right to counsel in the contexts of an arrest, interrogation and confession (Miranda).
6. Compare and contrast different types of evidence.
7. Describe the impact of case law relative to arson investigations.
8. Apply investigative techniques, including assignment receipt; scene response; application of scientific methodology; scene documentation/examination; evidence identification, collection and preservation (chain of custody); witnesses/suspect interrogation; and investigative case file/report development.

Module V: Strategies for Combating Arson

After completing this module, you will be able to:

1. Discuss the role of the community in arson reduction efforts.
2. Discuss the role of local public safety organizations in developing incendiary mitigation programs.
3. Discuss the role of the private sector in arson mitigation.
4. Define the use of pattern recognition and other profiling techniques in identifying arson-prone targets.

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- List sources of data available at the local, state and federal levels in planning anti-arson strategies.
 - Define the main elements of an effective incendiary fire prevention program.

Available texts

International Association of Arson Investigators, International Association of Fire Chiefs, & National Fire Protection Association. (2019). *Fire investigator: Principles and practice to NFPA 921 and 1033* (5th ed.). Jones & Bartlett Learning. ISBN: 9781284140743. <https://www.psglearning.com/catalog/productdetails/9781284140743>

Icove, D. J., De Haan, J. D., & Haynes, G. A. (2013). *Forensic fire scene reconstruction* (3rd ed.). Pearson. ISBN-10: 0-13-260577-5; ISBN-13: 978-0-13-260577-9. <http://www.bradybooks.com/store/product.aspx?isbn=0132605775>

Due to the dynamic nature of fire investigation, it is also recommended that instructors build content around contemporary readings.

Additional texts

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous Materials, Health and Safety, Wildfire.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- ◆ <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- ◆ <https://apps.usfa.fema.gov/publications/>
- ◆ <http://www.homefiresprinkler.org>

Bryan, J. L. (March 1993). *Fire suppression and detection systems* (3rd ed.). MacMillan Publishing.

Gagnon, R. (1997). *Design of water-based fire protection systems*. Delmar, Cengage Learning.

Smith, C. A., Wieder, M., Brakhage, C. (2001). *Private fire protection and detection* (2nd ed.). International Fire Service Training Association.

SFPE: <http://www.sfpe.org/>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. History and Development of Fire Analysis and Investigation.
- II. Chemistry of Fire.
 - A. The Oxidation/Reaction/Reduction Process.
 - B. Fuels.
- III. Fire Dynamics.
 - A. Heat Transfer.
 - B. Ignition.
 - C. Flux.
 - D. Heat Release Rates.
 - E. Ventilation.
 - F. Flashover.
- IV. Fire Scene Investigation.
 - A. First Responder Responsibilities.
 - B. Scene Preservation and Tactical Decision-Making.
 - C. Scene Investigation.
 - D. Special Scene Investigations.
 - E. Legal Considerations.
- V. Incendiary Crime Investigation.
 - A. The Investigative Planning Process.
 - B. The Investigation Report.
- VI. Environmental Factors Influencing Arson.
 - A. Why People Set Fires.
- VII. The Sociology of Arson.
 - A. Changing Value Systems.
- VIII. The Psychology of Arson.
 - A. The Juvenile Firesetter.
 - B. Characteristics of a Pyromaniac.
 - C. Firesetters.
 1. Vanity.
 2. Revenge.
 3. Serial Arsonists.
 4. Other Criminals.

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- IX. Legal Considerations and Preparing for Trial.
 - A. Common-Law Definitions.
 - B. Statutory Definitions.
 - C. Federal Law in Arson Prosecution.
 - D. Search and Seizure.
 - E. Search.
 - 1. Administrative Search Warrants.
 - 2. Criminal Search Warrants.
 - 3. Warrantless Searches.
 - 4. Arrest and Detention.
 - 5. Process of Administering Justice.
 - 6. Evidence.
 - X. Managing the Fire Investigation Unit.
 - A. Quality Management and TQM.
 - B. Case Management.
 - C. Training, Standards and Accreditation.
 - XI. Intervention and Mitigation Strategies for Combating Arson.
 - A. The National Juvenile Firesetter/Arson Control and Prevention Program.
 - B. Community Partnerships.
 - C. Private Sector Partnerships.
 - D. Technology.
 - E. Data Resources.
 - XII. The Future of Arson Investigation.
 - A. Fire Modeling.
 - 1. Computer Fire Models.
 - 2. Deterministic Fire Models.
 - 3. Probabilistic Fire Models.
 - 4. Expert Systems.

Fire Protection Structures and Systems Design (C0295)

Course description

This course examines the underlying principles involved in structural fire protection systems and building furnishings, as well as fire protection systems including water-based fire suppression systems, fire alarm and detection systems, special hazard suppression systems, and smoke management systems.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Analyze building structural components for fire endurance and fire resistance.
2. Understand the flame spread and smoke production properties of building furnishings and materials.
3. Analyze, evaluate and determine appropriate use for fire detection and alarm systems, water-based fire suppression systems, special hazard fire suppression systems, and smoke management systems with a sophisticated understanding of how they integrate to function as a complete life-safety system.
4. Understand the fundamental principles related to structural fire protection, building furnishings and fire protection systems.

Course objective

Module 1: Fire-Resistant Building Components and Assemblies

After completing this module, you will be able to:

1. Explain the objective of fire-resistant building components and assemblies.
2. Summarize the ASTM E-119 test procedure and the parameters that influence its validity.
3. Analyze how elevated temperatures affect steel, concrete, masonry and wood assemblies.
4. Outline potential problems for fire service personnel relative to the fire resistance requirements of steel, concrete, wood and masonry structures.
5. Compare 3 means of providing fire protection for steel members.
6. Explain the fire hazards associated with unenclosed vertical openings, atriums and concealed spaces.
7. Differentiate among 3 different methods used to limit horizontal fire and smoke spread in a building.

Module 2: Building Furnishings and Materials

After completing this module, you will be able to:

1. Summarize the application of the Steiner Tunnel Test (ASTM E-84) and its 3 flame-spread classifications.
2. Differentiate between flame-spread index and smoke density.
3. Explain the role of floor materials in corridor fire spread.
4. Articulate the 4 categories of dangerous effects of smoke.
5. Explain 1 smoke toxicity testing method.
6. List 2 organizations that have promulgated standards for furniture flammability.
7. Summarize 4 characteristics that contribute to the fire hazard of furniture.
8. Generalize the role of furnishings (materials and placement) in fire growth development.

Module 3: Fire Detection and Alarm Systems

After completing this module, you will be able to:

1. Explain the basic operating principles of smoke, heat and flame detectors and provide applications for each.
2. Differentiate between an ionization and photoelectric smoke detector.
3. Differentiate between rate-of-rise, rate-compensated and fixed-temperature heat detectors.
4. Besides detection devices, list and describe 3 devices that can initiate a fire alarm system.
5. Classify 4 types of fire alarm system indicating devices.
6. Demonstrate the temporal code 3 fire alarm signal.
7. Summarize the operational characteristics of a voice fire alarm system.
8. Explain the 3 operational characteristics of a fire alarm control panel (alarm, trouble, supervisory).
9. Determine 2 advantages and disadvantages of remote fire alarm system monitoring.

Module 4: Fire Suppression Systems

After completing this module, you will be able to:

1. Compare the basic suppression principle for sprinkler, foam, dry-chemical, carbon dioxide and halon replacement systems, and provide applications for each.
2. Explain the difference between wet, dry, deluge and pre-action sprinkler systems.

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3. Assess the benefits of residential fire sprinkler systems and residential sprinkler legislation.
 4. Select 3 appropriate water storage and supply sources for a water-based fire suppression system.
 5. Classify sprinklers based on position, temperature rating and pattern.
 6. Apply an appropriate sprinkler system density for 4 occupancy classifications.
 7. Explain 2 appropriate applications for a water-mist system.
 8. Identify the required flow and pressure for the 3 types of standpipe system classifications.
 9. Illustrate a standard fire pump curve, and identify the 3 important performance points.
 10. Compare and contrast vertical and horizontal fire pumps and apply applications for each.
 11. Outline the procedure for performing a fire pump service test.
 12. Classify 3 types of foam extinguishing agents.
 13. Determine the correct type of system for the protection of a kitchen hood and describe its method of operation.
 14. Explain the operating principle of a carbon dioxide suppression system.
 15. Explain why the installation of new halon suppression systems is prohibited in the United States.
 16. Explain the development of 2 types of halon replacement systems.

Module 5: Smoke Management Systems

After completing this module, you will be able to:

1. Explain 4 factors influencing smoke movement in a building.
2. Explain stack effect.
3. Distinguish between passive and active smoke management.
4. Compare and contrast 3 types of active smoke management systems.
5. Outline the methodology used to test a smoke management system.
6. Summarize the use of the firefighters' smoke control station.

Available texts

Cote, A. E. (Ed.). (2008). *Fire protection handbook, volumes I and II* (20th ed.). National Fire Protection Association. <http://catalog.nfpa.org/Fire-Protection-Handbook-20th-Edition-P13860.aspx>

International Fire Service Training Association. (2011). *Fire detection and suppression systems* (4th ed.). Fire Protection Publications.

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous Materials, Health and Safety, Wildfire.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>
- 🔗 <http://www.homefiresprinkler.org>

Bryan, J. L. (March 1993). *Fire suppression and detection systems* (3rd ed.). MacMillan Publishing.

Gagnon, R. (1997). *Design of water-based fire protection systems*. Delmar, Cengage Learning.

Smith, C. A., Wieder, M., Brakhage, C. (2001). *Private fire protection and detection* (2nd ed.). International Fire Service Training Association.

SFPE: <http://www.sfpe.org/>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Historical Background.
 - A. Conflagrations, Large-loss Fires.
 - B. Fire Protection Systems.
- II. Fire Resistance and Endurance.
 - A. Test Types and Resources.
 - B. Application of Test Results.
- III. Fire Resistance Computations and Evaluation Procedures.
 - A. Structural Member Properties.

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- IV. Flame Spread Evaluation.
 - A. Steiner Tunnel Testing.
 - B. Radiant Panel Testing.
 - C. Floor Cover Material Evaluation.
 - V. Smoke Production.
 - A. Nature and Hazards of Smoke.
 - B. Smoke Testing Methods.
 - VI. Furnishings and the Building.
 - A. Regulation.
 - B. Furniture Fire Testing.
 - C. Heat Release Rate.
 - VII. Detection Systems and the Building.
 - A. Fire Signature.
 - B. Detector Types and Operations.
 - C. Detector Inspection and Maintenance.
 - VIII. Smoke Control Systems.
 - A. Smoke Dynamics.
 - B. Smoke Management.
 - C. System Testing and Inspection.
 - D. Stairwell Pressurization.
 - IX. Alarm and Communication Systems.
 - A. Circuit Types.
 - B. Alarm Signals.
 - C. Communication Systems.
 - X. Water Supply Systems.
 - A. Historical Development.
 - B. Water System Considerations.
 - C. Fire Flow Calculations.
 - D. High-Rise Water Supply.
 - XI. Stationary Fire Pumps.
 - A. Classification.
 - B. Installation.
 - C. Performance.
 - D. Testing.
 - XII. Sprinkler Systems.
 - A. Residential.
 - B. Early Suppression Fast Response (ESFR).
 - C. Hydraulic Calculations and Design Criteria.
 - D. Water Supply and Demand Curves.

XIII. Evaluating Sprinkler System Design.

- A. Building and Fire Code Requirements.
- B. Role of the Authority Having Jurisdiction (AHJ).
- C. Plan Review.

XIV. Specialized Suppression Systems.

- A. Gaseous Agent Systems.
- B. Dry Chemical Systems.
- C. Foam Systems.

Disaster Planning and Control (C0296)

Course description

This course examines concepts and principles of community risk assessment, planning and response to fires and natural and human-caused disasters, including the NIMS Incident Command Systems (ICS), mutual-aid and automatic response, training and preparedness, communications, civil disturbances, terrorist threats/incidents, hazardous materials planning, mass casualty incidents, earthquake preparedness, and disaster mitigation and recovery.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Discuss the importance of disaster planning, preparation and mitigation.
2. Evaluate the hazard assessment processes and the role of the firefighter in community disaster planning and recovery.
3. Assess hazard response and planning procedures.
4. Define the impact of hazard occurrence on community response.
5. Define the parameters and effectiveness of an Emergency Operations Plan (EOP) and its components.
6. Differentiate the multilevel agency responsibilities in disaster mitigation.
7. Define the relationships between disaster planning, mitigation and recovery.

Course objectives

Module I: Disaster Anticipation and Preparation

After completing this module, you will be able to:

1. Explain the generic and technical meanings of disaster and emergency.
2. Identify the types of disasters and their similarities and differences.
3. Explain the importance of disaster planning.
4. Differentiate between human-caused and technological hazards, natural hazards, and domestic security threats.
5. Identify the distinguishing characteristics of hazards, emergencies and disasters.
6. Analyze the provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act as they relate to the National Response Plan/National Response Framework (NRP/NRF) for local and state emergencies.
7. Describe why a team approach to disaster planning is recommended.

Module II: Managing Disasters

After completing this module, you will be able to:

1. Describe the hazard assessment process.
2. Explain the purpose of capability assessment.
3. Define the concepts of mutual-aid and automatic aid.
4. Identify the personnel and agencies that play a role in formulating an EOP.
5. Analyze the fire and emergency services department's leadership role in integrated community disaster planning.
6. Differentiate the availability of outside resources: local, state, federal and private.
7. Identify communication issues regarding the various levels of people in local, state and federal agencies that will respond in times of disaster.
8. Define the modes of communication that can be used during major emergencies and the individuals who need to share information.
9. Analyze the communications needs of each organizational level.
10. List the communication modes available to emergency response agencies during major emergencies.
11. Determine the different uses of computers during major emergencies.
12. Describe the most common types of communication problems that develop during major emergencies.
13. Illustrate alternative/redundant communications systems in the event of system failure.

Module III: Frequent Threats — Fire, Transportation and Hazmat

After completing this module, you will be able to:

1. Describe the background and development of the NIMS ICS.
2. Identify the principles and features of the NIMS ICS.
3. Describe how a NIMS ICS incident organization expands or contracts to meet operational needs of the incident or event.
4. Identify the difference in required responses for different types of hazards.
5. Describe examples of each hazard type.
6. Assess the unique planning issues for each hazard type.
7. Analyze the impact on the community of each hazard type.

Module IV: Growing Threats, Global Concerns

After completing this module, you will be able to:

1. Identify the personnel and agencies that play a role in formulating an EOP.
2. Outline the 4 problems that confront fire chiefs and emergency services managers in the development of EOPs.
3. Identify the steps in preparing a written EOP.
4. Assess the purpose and components of the EOP basic plan.
5. Evaluate how an EOP resource inventory supports the plan.
6. Review the planning issues that are common to the development of most EOPs.
7. Describe the multiagency responsibilities of disaster response.
8. Identify how functional annexes and hazard-specific appendices support the overall emergency management plan.
9. Compare and contrast the differences in required responses for different types of hazards.
10. Analyze the use of Branches, Divisions and Groups within the Operations Section, and correlate the supervisory titles associated with each level.
11. Identify the advantages of Unified Command and the kinds of situations that may call for a Unified Command organization.
12. Describe the primary features of a Unified Command organization.
13. Classify the kinds of incident management problems that the lack of multiagency coordination can create.
14. Compare the levels at which multiagency coordination is commonly accomplished.
15. Identify the primary components of a multiagency coordination system.

Module V: Natural Disasters and Recovery

After completing this module, you will be able to:

1. Identify the 4 phases of a disaster and describe the partnerships among the federal, state and local governments in each of the 4 phases.
2. Compare several forms of federal assistance, and explain the terms and conditions under which federal disaster relief may be made available.
3. Outline the sequence of events through which a disaster may be declared by the president.
4. Identify the stages of the damage assessment process and the reporting requirements following a disaster.
5. Describe the roles and responsibilities of key state and federal personnel in responding to a declared major disaster.

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6. Assess the various federal, state and local assistance programs available to disaster victims during the recovery phase.
 7. Determine some typical responses that may be anticipated from disaster survivors and workers.
 8. Calculate the capabilities of and methods for accessing the crisis counseling and stress management programs during disaster response and recovery operations.
 9. Describe the federal assistance programs available to supplement state and local governments recovering from a major disaster.
 10. Correlate the concepts of mitigation and recovery with natural and technological hazard events.
 11. Analyze the interrelationships between mitigation and recovery phases.

Available text

It is also recommended that the instructor builds content around contemporary readings and current events.

Kramer, W. M. (2009). *Disaster planning and control*. PennWell Books. ISBN: 9781593701895.

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/> (See Arson, Fire Data, Fire Protection, Fire Service Operations, Hazardous Materials, Health and Safety, Wildfire.)

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>
- 🔗 <http://www.homefiresprinkler.org>

Bryan, J. L. (March 1993). *Fire suppression and detection systems* (3rd ed.). MacMillan Publishing.

Gagnon, R. (1997). *Design of water-based fire protection systems*. Delmar, Cengage Learning.

Smith, C. A., Wieder, M., Brakhage, C. (2001). *Private fire protection and detection* (2nd ed.). International Fire Service Training Association.

SFPE: <http://www.sfpe.org/>

Course outline

- I. History, Definition and Disaster Profile.
 - A. History of FEMA.
- II. The Integrated Emergency Management System.
- III. Preparedness.
 - A. Hazard Assessment.
 - B. Hazard Identification.
 - C. Vulnerability.
 - D. Rating the Risk.
 - E. Resources.
 1. Ordering Systems.
 2. Emergency Response Directories.
 3. Resource Agreements.
- IV. Developing an Emergency Response Plan.
 - A. The Planning Process.
 - B. Basic Plan Content.
- V. Functional Annexes and Hazard-Specific Appendices.
 - A. Functional Annexes.
 1. Direction and Control.
 2. Communications.
 3. Warning.
 4. Emergency Public Information.
 5. Evacuation.
 6. Mass Care.
 7. Health and Medical.
 8. Resource Management.
 - B. Development of Hazard-Specific Appendices.
- VI. Managing the Disaster.
 - A. History of ICS Development.
 - B. ICS Features and Functions.
 - C. ICS Organization.
 - D. Unified Command.
 - E. Area Command.
 - F. Emergency Operation Centers/Multiagency Coordination System.
- VII. Communications.
 - A. Interpersonal Communications.
 - B. Data Technologies.

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- C. Communications in Emergency Response Operations.
 - D. Communications Center Operations and Personnel.
 - E. Planning for Communications.

VIII. Evaluating the Plan.

- A. Exercises.
 - 1. Tabletop Exercises.
 - 2. Functional Exercises.
 - 3. Full-Scale Exercises.

IX. Aftermath and Recovery.

- A. Acronyms.
- B. History and Philosophy of Disaster Assistance.
- C. Federal Disaster Declaration.
- D. Damage Assessment.
- E. Disaster Recovery Operations.
- F. FEMA's Role in Disaster Response.
- G. State and Federal Roles and Responsibilities.
- H. Coordinating Resources.
- I. The Application Process.
- J. Hazard Mitigation and Disaster Recovery.
- K. Media Relations.
- L. Community Relations.
- M. Human Response to Disaster.

Fire Service Ethics (C0303)

Course description

This course examines the basic principles of ethics as related to fire service operations and management with special attention given to current issues in the fire service.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Develop a value statement for your department.
2. Devise and implement an ethics training program for your department.
3. Review and revise minority recruitment strategies.

Course objectives

Upon completion of this course, you will be able to:

1. Identify what the term ethics means and why it is important to the fire service.
2. Distinguish between social norms, morality, ethics and the law.
3. Compare and contrast the concepts of values, beliefs and attitudes.
4. Explore how the concepts of accountability, obligation and responsibility define ethical behavior.
5. Contrast modern and classical philosophy of ethical study as they relate to the fire service.
6. Contrast and compare fire service ethics standards and guidelines.
7. Review a firefighter's professional obligations and responsibilities.
8. Appraise the ethical responsibilities associated with leadership.
9. Evaluate current issues in fire service ethics.
10. Identify the values of a diverse workplace.
11. Identify benefits, hindrances and tactics related to achieving diversity.
12. Compare and contrast internal versus external ethical control systems.
13. Review the principles of integrity-based management programs.
14. Apply relevant state and federal ethics laws to fire service administration.
15. Appraise various influences on ethical decision-making.
16. Evaluate tactics for implementing an ethical culture.
17. Explore best practices in building an ethical culture.

Available text

Walker, H. S. (2020). *Fire service ethics*. Jones & Bartlett Learning. ISBN: 9781284171655.
<https://www.psglearning.com/fire/science/productdetails/9781284171655>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Point of contact

H. Scott Walker, Western Illinois University (309-298-2625)
Email: hs-walker@wiu.edu

Course outline

Section I — Foundational Studies

- I. Introduction.
 - A. What is Ethics?
 - B. Why Study Ethics?
 - C. Why be Ethical?
 - D. Why is Ethics of Value to the Fire Service?
- II. Understanding Ethics.
 - A. Social Norms.
 1. Norms.
 2. Folkways.
 3. Mores.
 4. Taboos.
 - B. Morality.
 1. What Is It?
 2. Where Does It Come From?
 - C. Ethics.
 1. How Do They Differ From Morals?
 2. How Are Ethics Determined?
 3. Professional Versus Personal Ethics.
 - D. Law.
 1. Mallum en Se and Mallum Prohibitum.
 2. Law and Ethics.
 3. Law and Morality.
 - E. The Role of Religion.
 1. Religion and Morality.
 2. Religion and Free Will.
- III. Behavior Influences.
 - A. Values.
 - B. Beliefs.
 - C. Attitudes.
 - D. Distinguishing Needs and Wants.

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- E. The Role of Responsibility.
 - 1. Subjective Responsibility.
 - 2. Objective Responsibility.
 - F. Integration of Behavior.
- IV. Ethics and Philosophy.
- A. Validity.
 - B. Normative Ethics.
 - 1. Utilitarianism.
 - 2. Deontology.
 - C. Virtue Ethics.
 - D. Constructivism.
 - 1. Benefic Ethics.
 - 2. Egoism.
 - E. Social Contracts.
 - F. Subjectivism.
 - G. Meta-ethics.

Section II — Ethics in the Fire House

- V. Professional Ethics Within the Fire Service.
- A. Are We a Profession or a Job?
 - B. Professional Standards.
 - C. Firefighter Code of Ethics.
 - D. The Importance of Character.
- VI. Firefighter's Responsibility.
- A. Fire Service Values.
 - 1. Duty.
 - 2. Compassion.
 - 3. Honesty.
 - 4. Teamwork.
 - 5. Competency.
 - 6. Bravery.
 - 7. Loyalty — Thin Red Line.
 - B. Objective Responsibilities.
 - 1. Department Policy.
 - 2. Competency.
 - 3. Safety.
 - C. Honoring Trust.
 - 1. Privacy.
 - 2. HIPAA.
 - 3. Gossip.
 - D. Subjective Responsibility.
 - 1. Personal Values.
 - 2. Career Ambition.
 - 3. Tradition.
 - 4. Balancing Home Life With Work Life.
 - E. Benefic Ethics and Contact Theory Applied to Emergency Response.

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- VII. Ethics and Leadership.
 - A. Ethics and Company Officers.
 - 1. Enforcing Policy.
 - 2. Modeling Behavior.
 - B. Duty.
 - 1. Duty to Teach.
 - 2. Duty to Superiors.
 - 3. Duty to Subordinates.
 - C. Balancing Leadership.
 - 1. Unions and Management.
 - D. Servant Leadership.
 - VIII. Contemporary Issues.
 - A. Privacy.
 - B. Off-Duty Activity.
 - C. Pay per Spray.
 - D. Social Media.
 - E. Politics.
 - F. On-the-Job Relationships.
 - G. Harassment.
 - H. Use of Internet.
 - IX. Diversity.
 - A. What Is Diversity?
 - 1. Value in Diversity.
 - 2. Organizational Adaptation.
 - 3. The Ethics of Workplace Fairness.
 - B. Recruitment and Hiring.
 - 1. Legal Issues.
 - 2. The Ethics of Affirmative Action.
 - 3. The Ethics of Quotas.
 - C. Promotions.
 - D. Women's Issues in the Fire Service.
 - E. Hostility in the Workplace.

Section III — Administrative Ethics

- X. Managing Ethics.
 - A. External Governance.
 - 1. Herman Finer.
 - 2. The Role of Policy in Ethics.
 - B. Internal Governance.
 - 1. Carl J. Friedrich.
 - C. Bounded and Unbounded Ethical Systems.
 - D. Compliance-Based Versus Integrity-Based Systems.
 - 1. What Are Compliance-Based Ethical Controls?
 - 2. What Are Integrity-Based Controls?
 - 3. Limits of Each Control System.
 - 4. Results of Each System.

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- E. Organization Structure and Ethics.
 - 1. Scalar Structure.
 - 2. Flat Structure.

 - XI. Leading an Ethical Culture.
 - A. Unbounded Ethics.
 - B. Building an Ethical Culture.
 - 1. The Role Value-Based Leadership.
 - 2. Testing for Ethics.
 - C. Maintaining an Ethical Culture.
 - 1. Modeling Ethics.
 - 2. Training in Ethics.
 - 3. Ethics Within Training.
 - 4. Continuity of Values Through Chain of Command.

 - XII. Fire Service Ethics and the Law.
 - A. Ethical Conflicts.
 - 1. Conflict of Interest.
 - 2. Conflict of Authority.
 - 3. Conflict of Roles.
 - 4. Quid Pro Quo.
 - B. Social Ethical Controls.
 - 1. Equal Opportunity.
 - 2. Sexual Harassment.
 - 3. Diversity.
 - 4. ADA Rules.
 - C. Financial Ethical Controls.
 - 1. Accounting Practices.
 - 2. Bidding and Purchasing.
 - 3. Appropriation of Funds.
 - D. Ethics of Confidentiality.
 - 1. HIPAA.
 - 2. Trade Secrets.
 - 3. Personnel Records.
 - E. Ethics and Transparency.
 - 1. Freedom of Information.
 - 2. Open Meetings Acts.
 - 3. Reporting Requirements.
 - 4. Record Keeping and Disposal.
 - a. Email and Correspondence.
 - 5. Whistle Blowers.

Section IV — Applied Ethics

- XIII. Ethical Decision-Making.
 - A. Levels of Ethical Reflection.
 - 1. Morals Rules Level.
 - 2. Ethical Analysis.
 - 3. Post-ethical Analysis.
 - 4. Descriptive Models.

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- B. Conscience or Obligation?
 - 1. Moral Imperatives.
 - 2. Fiduciary Responsibility.
 - C. Outcome Versus Process.
 - D. Loci of Control.
- XIV. Moral Disengagement.
- A. Moral Disengagement.
 - 1. Rationalization.
 - 2. Context.
 - 3. Priority Confusion.
- XV. A Strategic View of Fire Service Ethics.
- A. Ethics Challenges Facing the Fire Service.
 - B. Adapting to 21st Century Realities.
 - C. Developing Professional Standards.
 - D. Ethics Within Professional Development.



EMS (Core)

EMS Risk Management and Safety (C0241)

Course description

This course introduces the student to the risk management principles of an EMS agency. Students will focus on safety from the perspective of the field provider.

Prerequisites

None.

Course outcomes

Upon completion of this course, students will be able to:

1. Define risk management and differentiate this concept from the concepts of prevention and loss control.
2. Outline the steps that are required to conduct a comprehensive investigation into a workplace accident.
3. Identify 5 safety-related areas of concern within their organization that could be addressed or improved by the application of risk management principles and practices.
4. Identify and analyze the major causes of line-of-duty deaths related to health, wellness, fitness and vehicle operations.
5. Draft a model policy, procedure or guideline that can be implemented within an organization to address a specific area of safety or risk management

Available text

Lindsey, J. T., & Monosky, K. T. (2014). *EMS safety and risk management*. Pearson. ISBN-10: 0-13-502472-2; ISBN-13: 978-0-13-5024720. <http://www.bradybooks.com/store/product.aspx?isbn=0135024722>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/>

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Fire Tests/Data, Software/Models, Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hsdl.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

Because of the dynamic nature of this subject material, we suggest the instructor build content to include contemporary readings.

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Course outline

- I. Introduction.
 - A. Risk Management Versus Loss Control.
 - B. Safety.
- II. Safety Program Management.
 - A. Perspective on Safety.
 - B. Management.
 - C. Financial Aspects.
 - D. Insurance.
- III. Developing a Safety Program Goals.
 - A. Description of Position.
 - B. Program Components.
 - C. Creating a Safety Culture.
 - D. Required Postings.
 - E. Safety Committee.
- IV. Risk Management Process.
 - A. What is Risk Management?
 - B. Risk Identification and Prevention.
 - C. Cost of Risk Control.
- V. Vehicle Driving.
 - A. Defensive Driving Techniques.
 - B. Driver Selection.
 - C. Maintenance.
 - D. SOPs.
- VI. Station Safety.
 - A. Office Safety.
 - B. Compressed Gases.
 - C. Work Area.
 - D. Vehicle Maintenance Areas.
 - E. Storage.

-
- VII. Accident Investigation.
 - A. Preparation.
 - B. Reporting Process.
 - C. Investigation Process.
 - D. Investigation Phases.

 - VIII. Record Keeping.
 - A. Infectious Diseases.
 - B. Safety Audits.
 - C. Training.
 - D. Accident Reports.
 - E. Injury Reports.
 - F. Safety Meetings.

 - IX. Safety Officer.
 - A. Role of the Safety Officer.

 - X. Resources for Risk Management and Safety.
 - A. Regulating Agencies.
 - B. Associations.
 - C. Education.

Management of Emergency Medical Services (C0244)

Course description

This is an upper-level baccalaureate course for students interested in the practice and principles of emergency medical services systems management and the processes that contribute to the effectiveness of day-to-day operations within an EMS organization. This course introduces the EMS professional to topics that include government structure, strategic planning, injury prevention, risk management and safety, customer service, human resources management, financial management, fleet management, career development, quality management, data collection and research, labor relations, and special operations.

Prerequisites

None.

Course outcomes

Upon completion of this course, students will be able to:

1. Discuss the basic philosophy, organization and operation of injury prevention and risk reduction programs.
2. Compare and contrast management and leadership.
3. Provide practical examples of the principles of customer service in EMS.
4. Apply the techniques for conducting an effective performance appraisal.
5. Identify strategies to optimize reimbursements for EMS services.
6. Apply quality improvement techniques to various aspects of EMS operations.
7. Define due process, and apply the principles of a progressive disciplinary program.
8. Define ethical behaviors and the decision-making strategies when faced with an ethical dilemma.

Course objectives

Module 1: Government Structure and EMS

After completing this module, you will be able to:

1. Identify key historical events and figures that have impacted the progress of emergency medical services (EMS) and discuss their collective influence.
2. Identify key federal, state and local legislative events that have formed the emergency medical services and discuss their collective influence.
3. Identify federal, state and local EMS system components and discuss their interrelationship.
4. Identify the components of an EMS system.
5. Explain the various National Highway Traffic Safety Administration EMS agendas for EMS-related topics.
6. Identify the various trade organizations that support EMS activities.

Module 2: Strategic Planning for EMS

After completing this module, you will be able to:

1. Define strategic planning and the time frames that are incorporated in strategic planning.
2. Define the contingent planning model for strategic planning.
3. Use a multipoint plan to create components of a strategic plan.
4. Demonstrate how to prioritize strategic planning concepts and items.
5. Define the strategic planning items — and their purposes — that would be included in a fire or EMS plan.
6. Explain and incorporate a SWOT analysis into the planning cycle for a strategic plan.
7. Discuss the various considerations for calculating the cost of EMS services.
8. Define or identify the stakeholders in EMS.
9. Identify the management tools used to conduct project planning.
10. Describe the primary components of an EMS budget.
11. Identify proactive approaches to EMS funding.

Module 3: Manager to Leader

After completing this module, you will be able to:

1. Define the difference between management and leadership.
2. Identify the skills needed to be an EMS manager.
3. Identify the management processes and sentinel events in EMS operations.
4. Develop and define leadership activities and roles.
5. Understand how to create a vision and values statement.
6. Apply the concept of values to organizational leadership.
7. Understand and apply the principles of mentoring and coaching to EMS workers.

Module 4: Injury Prevention and EMS

After completing this module, you will be able to:

1. Describe the extent of the injury-prevention problem.
2. Establish what constitutes an injury.
3. Define the CDC injury-prevention model.
4. Describe the EMS manager's role in the public-health model.

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5. Explain the implementation process for injury-prevention programs.
 6. Identify resources available for EMS agencies to conduct injury-prevention activities.
 7. Design and implement prevention activities.
 8. Evaluate prevention activities.
 9. Build and manage a prevention program to disseminate information.
 10. Stimulate change through policy, enforcement, engineering and education.
 11. Define and describe concepts of attributable risk and explain how injuries are preventable.
 12. Describe general approaches to prevention, and demonstrate how conceptual models are used to describe multiple risk factors.

Module 5: Customer Service and Marketing

After completing this module, you will be able to:

1. Understand the principles of customer service.
2. Create a customer-service program for an EMS organization.
3. Understand and apply marketing concepts for any EMS agency.
4. Identify image-building activities to be conducted by EMS agencies.
5. Analyze and modify customer-service programs from EMS industry standards.
6. Understand the branding process for EMS agencies.

Module 6: Risk Management and Safety

After completing this module, you will be able to:

1. Identify principles of risk management.
2. Identify how to calculate the risk in EMS operations.
3. Conduct an analysis of a system failure.
4. Create an infection control program for EMS agencies.
5. Recognize and identify the safety issues surrounding EMS operations and how to mitigate those events.
6. Diagram the progression and response to litigation against an EMS organization.

Module 7: EMS Human Resources Management

After completing this module, you will be able to:

1. Identify the issues surrounding the EMS workforce of the future and the generation-specific issues that apply to managerial techniques in an organization.
2. Employ techniques to identify staffing needs for future EMS operations.
3. Perform a job-task analysis on an EMS position in the organization.
4. Identify and apply the techniques to conduct an effective performance appraisal, and identify problems associated with conducting performance appraisals.
5. Identify the components of a positive discipline program, and implement a due-process procedure involving a disciplinary action.
6. Create a list of and identify the warning signs of workplace violence, and employ management activities to contain or prevent workplace violence.
7. Build an employee screening and hiring process.
8. Understand the application of labor laws that influence EMS operations.

Module 8: Management of EMS Education

After completing this module, you will be able to:

1. Understand the EMS Education Agenda for the Future.
2. Identify national resources to conduct EMS training.
3. Understand the national curricula and application to each provider level.
4. Build an EMS refresher course for any level of EMS provider.
5. Identify EMS management training programs and opportunities.
6. Conduct a training analysis of EMS needs.
7. Identify how to conduct training encompassing psychomotor skills, affective domain and didactic knowledge.
8. Apply standard procedures to evaluate training in accordance with accreditation standards.

Module 9: Financial Management

After completing this module, you will be able to:

1. Discuss the Medicare Ambulance Fee Schedule Final Rule and identify strategies for optimizing reimbursement within its requirements and limitations.
2. Describe the historical development of programs administered by the Centers for Medicare and Medicaid Services.

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3. Identify the requirements of Medicare Part B as they apply to ambulance suppliers, including levels of service, medical necessity, physician certification, origins and destinations, vehicles, and staffing.
 4. Explain the alternative components used to fund ambulance service.
 5. Describe the financial policies that are addressed in budgeting and in types of budgets.
 6. Calculate the unit hour utilization and various benchmarks, as well as seasonal fluctuations for various levels of service for their local areas.
 7. Discuss various methods and considerations for costing-out service.
 8. Understand managed care contracting strategies.

Module 10: Medical Practice

After completing this module, you will be able to:

1. Understand and define the role of the physician medical director for an EMS service.
2. Understand the selection process and qualifications desired in a medical director.
3. Differentiate between online and offline medical control.
4. Identify the areas of responsibility that need physician involvement in an EMS organization.
5. Understand and create a system that can be used for the physician in due process to discipline an EMS worker.
6. Identify the training and opportunities to promote professional development for a physician involved with or entering the field of EMS.
7. Understand the role of the EMS medical director in developing online and offline medical control.
8. Describe the network opportunities for a physician medical director.

Module 11: Fleet Management

After completing this module, you will be able to:

1. Discuss various considerations for calculating the cost of an EMS service.
2. Distinguish between functional and direct services for operating budgets.
3. Describe the inspection processes for equipment.
4. Compare and contrast the concepts of unit-hour utilization and in-service ratios when determining workload.
5. Calculate cost per capita and cost per response for EMS runs.
6. Apply cost-out strategies for a variety of EMS system components.

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7. Track and apply costing mechanisms for soft supplies.
 8. Understand the types of inventory systems and replacement plans.
 9. Track fleet maintenance and vehicle cost, including failure rates.
 10. Determine the equipment needed in the system and the specifications of that equipment.
 11. Understand and apply federal, state and local specifications and procurement processes for ambulances, biomedical equipment and durable equipment.

Module 12: Career Development and Staff Focus

After completing this module, you will be able to:

1. Create a map of a career plan and personal growth path to an EMS leadership position.
2. Understand how to develop and participate in a mentoring program.
3. Identify activities that enhance professional development.
4. Recognize, select and participate in staff development opportunities.
5. Identify education pathways for career and staff development.
6. Identify common experiences needed to be an effective EMS manager or leader.
7. List possible outside activities that enhance professional growth within the organization.

Module 13: EMS Quality Management

After completing this module, you will be able to:

1. Define the activities involved with quality assurance.
2. Define the activities involved with quality improvement.
3. Apply QI techniques to various aspects of EMS operations.
4. Identify the techniques to measure quality indicators in EMS operations.
5. Locate and identify other sources of quality data information that can improve EMS operations.
6. Create and implement a customer service assessment as part of a quality-improvement program.
7. Understand and create a process that helps document trends that require increased education or modification of the EMS systems.
8. Evaluate and apply the historical aspects of quality improvement to modern EMS efforts.
9. Chronicle the history of CQI activities

Module 14: Incident Management

After completing this module, you will be able to:

1. Apply the National Incident Management System to a mass-casualty incident.
2. Describe the major components of an incident management system.
3. Describe the functions of the Incident Commander at all EMS incidents.
4. Describe the federal typing of the EMS resources.
5. Identify the component of an EMS strike team and EMS task force.
6. Map the federal requirement and resources for NIMS training and EMS.
7. Differentiate between types of incident management teams and their applications.
8. Develop an incident management system for an EMS incident.

Module 15: Interagency Relations and Operations

After completing this module, you will be able to:

1. Compare and contrast mutual aid and automatic aid.
2. Identify the hierarchical organization of resources that respond to disaster from a regional, state and federal perspective.
3. Identify the intrastate and interstate mutual aid components.
4. Understand the needs and organizational applications of area and unified command.
5. Identify the components of the national response plans.
6. Match and define the emergency-support functions within the national response plan.
7. Navigate the progress and communication chain for an agency to secure resources from local, state and federal resources.

Module 16: Data Collection and EMS Research

After completing this module, you will be able to:

1. Evaluate the different types of research.
2. Understand the domains of EMS research.
3. Deploy specific research methodologies to the prehospital setting.
4. Define validity and reliability in scientific research and data.
5. Apply GIS concepts to EMS-related activities.
6. Recognize the federal, state and local data-collection systems.
7. Link data to quality improvement initiatives in EMS.

Module 17: Legal and Labor Relations

After completing this module, you will be able to:

1. Define the types of law applicable to EMS.
2. Identify and apply the federal legislation to EMS.
3. Understand and apply legislative mandates to EMS operations.
4. Design and understand the privacy compliance for an EMS operation that meets federal HIPAA regulations.
5. Identify case law affecting EMS operational systems.
6. Define due process, and apply the principles of progressive discipline to labor disputes involving EMS.
7. Recognize the Fair Labor Standards Act (FLSA) applications to EMS workers and fire-based EMS.
8. Define ethical behaviors, and apply decision-making strategies when faced with ethical decisions.
9. Identify contemporary issues in EMS litigation.

Module 18: EMS Management of Communications Centers

After completing this module, you will be able to:

1. Establish programs that use emergency medical dispatch.
2. Administer emergency medical dispatch programs.
3. Monitor and improve emergency medical dispatch operations.
4. Select and train personnel for emergency medical dispatch operations.
5. Evaluate and implement quality improvement/assurance programs.
6. Identify and implement training programs for emergency medical dispatch.
7. Recognize the legal case law related to communication centers.

Module 19: EMS Special Operations

After completing this module, you will be able to:

1. Explain the new mission of customer service in an all-hazards environment.
2. Describe the risk-analysis process.
3. Describe the mitigation role of local community officials as it relates to EMS response.
4. Define an all-hazards approach, and apply a checklist to preparing special events.
5. Given a medical evacuation of a patient by helicopter, identify the elements that affect or support local EMS special operations.

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6. Identify existing documentation resources to use for special operations during a special event.
 7. Identify the methods for developing and accessing state or statewide regional resource pools.
 8. Contrast the missions of tactical EMS.
 9. Analyze the role of EMS in a special operations environment as it relates to the medical support of hazardous materials operations.
 10. Explain the medical-legal issues involved in spectator care at mass gatherings.
 11. Discuss the process for implementing care systems at mass gatherings.

Available text

Evans, B. E., & Dyar, J. T. (2009). *Management of EMS*. Pearson. ISBN-13: 978-0132324328; ISBN-10: 0132324326. <http://www.bradybooks.com/store/product.aspx?isbn=0132324326>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/>

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Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Because of the dynamic nature of this subject material, we suggest the instructor build content to include contemporary readings.

Lessons learned information sharing:

- 🔗 <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Points of contact

Robert Seitz, University of Pittsburgh, seitzsr@upmc.edu
David S. Becker, IAFC, dsbeckermo@msn.com

Course outline

- I. Strategic Planning for EMS.
- II. Manager to Leader.
- III. Risk Management and Safety.
- IV. Injury Prevention and EMS.
- V. Data Collection and EMS Research.
- VI. Management of EMS Education.
- VII. EMS Human Resources Management.
- VIII. Career Development and Staff Focus.
- IX. Government Structure and EMS.
- X. Legal and Labor Relations.
- XI. Medical Practice.
- XII. EMS Quality Management.
- XIII. Interagency Relations and Operations.
- XIV. Incident Management.
- XV. EMS Management and the Role of Communications Centers.
- XVI. Financial Management.
- XVII. Customer Service and Marketing.
- XVIII. Fleet Management.
- XIX. EMS Special Operations.

Legal, Political, and Regulatory Environment of EMS (C0246)

Course description

This is an upper-level baccalaureate course for students interested in the field of legal, political and regulatory environment of EMS. This course introduces the EMS professional to the legal aspects of emergency medical services. Students explore issues in malpractice, consent and refusal of treatment; OSHA; employment issues; and risk management. EMS students gain insights into the legal liabilities in emergency medical services.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Identify potential legal and political issues in EMS.
2. Describe legal lessons learned from recent cases, and identify best practices in EMS to avoid legal liability.
3. Analyze and apply legal rules and political issues to manage risk.
4. Formulate political and legal conclusions and recommendations based on the analysis.
5. Locate and apply recent legal and legislative online resources.

Course objectives

Module 1: Basic Framework of the United States Legal System

After completing this module, you will be able to:

1. Identify federal and state laws that affect EMS.
2. Describe how the 3 branches of government work together to form laws and regulations that apply to EMS.
3. Differentiate between statutory law and case law and explain their applicability to the EMS world.
4. Possess a basic understanding of administrative and regulatory law, and be familiar with how administrative laws apply to the EMS system.
5. Identify several situations where EMS personnel could be subject to various provisions of the criminal laws.
6. List checks and balances built into the EMS system.
7. Describe the legal systems (federal and state courts) in the United States and their impact on EMS.
8. Within the context of the United States legal system, describe what challenges EMS organizations face in ensuring compliance with various laws.

Module 2: The Many Faces of Negligence

After completing this module, you will be able to:

1. Identify the elements of a negligence claim and apply situational factors to each element.
2. Recognize common EMS negligence scenarios and explain how to avoid them.
3. Identify the burden of proof placed upon a plaintiff in an EMS negligence case.
4. Apply knowledge of negligence to the special factors involved in EMS patient refusals to explain their special “high risk” nature.
5. Analyze best practices in the areas of training, record keeping and equipment logs and their significance in defense of a negligence claim.
6. Distinguish best practices to avoid liability during emergency vehicle operations.

Module 3: History of EMS Law

After completing this module, you will be able to:

1. Examine the “White Paper” and understand how the principles contained therein apply to today’s EMS system.
2. Grasp how the National Highway Transportation Act has shaped the development of EMS.
3. Comprehend EMTALA and how it affects EMS services.
4. Explain COBRA and its purpose.
5. Identify how “KKK-A-1822 Federal Specs for Ambulances and Revisions” were developed with future application of NFPA specifications.

Module 4: Forming an EMS System

After completing this module, you will be able to:

1. List and explain the primary differences between public and private EMS services in the areas of funding, oversight and regulatory issues.
2. Analyze the strengths and weaknesses of different structural concepts for EMS services.
3. Examine the role of the EMS medical director, and describe the role of the medical director in the EMS system.
4. Describe the various EMS reimbursement systems and federal regulations on billing for ALS and BLS ambulance transports.

Module 5: Safety Considerations

After completing this module, you will be able to:

1. Identify security issues faced by EMS personnel, including the scene, patient transport and emergency rooms in hospitals.
2. Discuss the steps EMS personnel can take to enhance their personal safety while at the scene, during transport and at hospital emergency rooms.
3. Describe the risks of exposure to infectious disease, and discuss the key elements of an infection control policy.
4. Describe why Congress established OSHA and its applicability to EMS, including those in public service in various jurisdictions and to those employed in private EMS companies.
5. Describe the background and purpose of the Ryan White Care Act and how that statute impacts the EMS service.
6. Discuss the workers' compensation system and the concept of an administrative system to compensate injured employees without regard to whether the employee was "at fault" when injured.

Module 6: Employment

After completing this module, you will be able to:

1. Analyze the issues associated with recruiting and retaining EMS personnel, and identify best practices in each area.
2. Describe the importance of background checks, and be familiar with the rules and regulations governing employer and employee rights during background checks.
3. Develop a basic understanding of the Civil Rights Act of 1964 and relate its provisions to the hiring of EMTs.
4. Identify the applicability of the Immigration and Naturalization Act, the Rehabilitation Act of 1973, and the Fair Credit Reporting Act, and analyze the ways in which each statute governs hiring practices.
5. Identify the critical incident stress management services available to EMS and the importance of confidentiality for those who receive such services.

Module 7: Staffing

After completing this module, you will be able to:

1. Review best practices in staffing of EMS personnel, including background checks (criminal history and credit history).
2. Identify the advantages of conducting skills testing of EMS applicants.
3. Describe the staffing requirement in your state for an ambulance responding to a scene and transporting a patient to the hospital.

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4. Describe why affirmative action consent decrees were issued in the 1970s, requiring dual hiring or dual promotions.
 5. Identify best practices in managing EMS personnel to avoid EEOC complaints concerning racial or religious discrimination.

Module 8: Compensation and Benefits

After completing this module, you will be able to:

1. Describe the Equal Pay Act and apply its implications to a modern EMS organization.
2. Analyze the Fair Labor Standards Act (FLSA) and gain an understanding of its basic provisions that apply to EMS, including hours of work and overtime pay requirements.
3. Develop an understanding of the Family Medical Leave Act (FMLA) and identify its applicability to the EMS organization.
4. Identify the components of the Uniformed Services Employment and Reemployment Rights Act (USERRA), and identify best practices for EMS organizations that have service members going into active military service.
5. Describe 401(k) plans and cafeteria plans and the advantages to employees to participate in such employer plans.

Module 9: Operational Laws

After completing this module, you will be able to:

1. Define sexual harassment, identify the components of a sexual harassment claim, and describe best practices for preventing or handling such issues.
2. Identify the components of the Americans with Disabilities Act (ADA) and apply the components to common scenarios faced by EMS organizations.
3. Describe the Age Discrimination in Employment Act (ADEA).
4. Identify the responsibilities of the EMS organization in a “Drug-Free Workplace” program.
5. Identify the issues associated with random drug testing and other substance abuse issues.
6. Analyze the issues associated with EMS blood draws for police-related matters, and be able to apply the analysis to the needs of the individual EMS organization.

Module 10: Funding Laws

After completing this module, you will be able to:

1. Develop a conceptual understanding of the Federal Anti-Kickback Statute as it relates to Medicare/Medicaid billing.
2. Identify business practices that could potentially place the EMS organization in violation of the Federal Anti-Kickback Statute.

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3. Define “Whistleblower Protection,” identify the many areas within EMS where a “whistleblower” may have protections, and analyze best practices for the EMS organization to handle these issues.
 4. Identify the various methods of “fee-for-service” arrangements, and identify pros and cons of each type of arrangement.
 5. Describe the special issues associated with an EMS service that is a “Not-For-Profit” organization under the IRS code.
 6. Analyze the role of the EMS organization in grant writing and grant acceptance.

Module 11: Legal Pitfalls of Discipline, Terminations, Layoffs

After completing this module, you will be able to:

1. Define due process, and apply the concepts of due process to common situations encountered during employment investigations in EMS organizations.
2. Describe the concept of retaliation, and review best practices to minimize the risk of a retaliation claim.
3. Define the Workers Adjustment and Retraining Notification Act (WARN) and define its purpose and compliance requirements.
4. Identify the importance of adequate policy manuals, and be able to apply the concepts to several scenarios within the EMS organization.
5. Explain “Employment-at-Will” legal doctrine, which applies in many states, and its effect on EMS personnel issues.
6. Discuss “Right-to-Work” statutes, which apply in some jurisdictions, and how these laws affect EMS personnel issues.
7. Analyze the issues associated with severance and layoffs, and form conclusions with best practices for the EMS organization.

Module 12: Records Retention

After completing this module, you will be able to:

1. Gain an understanding of the components of the Health Insurance Portability and Accountability Act (HIPAA), and analyze the issues that face EMS organizations in the areas of compliance, training and handling violations.
2. Analyze the issues associated with maintaining patient confidentiality in regard to written reports and other patient documents.
3. Identify the confidentiality requirements for employment records, and develop a basic understanding of public records law.
4. Draw conclusions on best practices for maintaining patient, employment and other necessary records that EMS organizations possess.

Module 13: National EMS Representation

After completing this module, you will be able to:

1. Identify where EMS falls in the United States' political structure.
2. Develop an understanding of how EMS fits into various types of interagency operations and how NIMS affects EMS organizations.
3. Identify the pitfalls associated with EMS' position within the governmental structure of the United States.
4. Analyze how local EMS organizations can play a role in the national EMS response programs.

Module 14: Professional Organizations

After completing this module, you will be able to:

1. Identify the professional organizations that play a role in the EMS field and describe what the role of each organization plays.
2. Identify key standards written by the organizations and how they apply to the EMS organization.
3. Gain a general understanding of EMS accreditation and the steps EMS organizations must take to achieve accredited status.

Module 15: Lobbying for Change

After completing this module, you will be able to:

1. Define "lobbying" and the role lobbyists play in the development of EMS legislation.
2. Describe the various rules and regulations associated with lobbying and how to avoid ethical violations.
3. Analyze the pros and cons of political activity at both the local and national levels.
4. Explain the role that organized labor and other professional organizations play in the political process.

Available texts

Bennett, L. T. (2017). *Fire service law* (2nd ed.). Waveland Press. ISBN: 978-1-4786-3397-6.

Bennett, L. T. (2018, June). *EMS law: Legal lessons learned* (2nd ed.). ISBN: 978-1-949104-03-5.

Hafter, J. L., & Fedor, V. L. (2004). *EMS and the law*. Jones & Bartlett Publishers. ISBN-13: 978-0763720681; ISBN-10: 0763720682.

Varone, J. C. (2014). *Legal considerations for fire & emergency services* (3rd ed.). PennWell Books. ISBN-13: 978-1593703479; ISBN-10: 1593703473. <http://www.pennwellbooks.com/fire-rescue/leadership-management/legal-considerations-for-fire-emergency-services-3rd-edition/>

Supporting references/research for faculty and students

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Because of the dynamic nature of this subject material, we suggest the instructor build content to include contemporary readings.

Lessons learned information sharing:

- <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- <https://apps.usfa.fema.gov/publications/>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Point of contact

Dr. Jeffrey Lindsey, Professor EMS, St. Petersburg College/NAEMSE rep.
jtlindsey1@aol.com

Course outline

- I. Basic Framework of the United States Legal System.
- II. The Many Faces of Negligence.
- III. History of EMS Laws.
- IV. Forming an EMS System.
- V. Safety Considerations.
- VI. Employment.
- VII. Staffing.
- VIII. Compensation and Benefits.
- IX. Operational Laws.
- X. Funding Laws.
- XI. Legal Pitfalls of Discipline, Terminations, Layoffs.

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- XII. Records Retention.
 - XIII. National EMS Representation.
 - XIV. Professional Organizations.
 - XV. Lobbying for Change.

EMS Quality Management (C0247)

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Demonstrate an understanding of quality and performance management as it pertains to EMS.
2. Explain the various components of a quality management program:
 - a. History.
 - b. Domains.
 - c. Measurement.
 - d. Analysis.
 - e. Management of the result.
3. Discuss the benefits of quality and performance management.

Course objectives

Module 1: Why Quality

After completing this module, you will be able to:

1. Identify the need for quality improvement.
2. Recognize the current status of medical errors.
3. Choose to engage in quality activities and offer quality initiatives.
4. Analyze the current state of medicine and issues in quality.
5. Locate and identify the source of current medical errors information.
6. Choose to participate in comparing and contrasting the need for quality improvement.

Module 2: History of Quality in EMS

After completing this module, you will be able to:

1. Identify the historical figures that have contributed to modern quality improvement initiatives.
2. Identify the government structures that support and facilitate quality in EMS.
3. Create and identify the components of a key indicator.
4. Defend the use of, or share, quality improvement initiatives with private industry or trade groups.
5. As an EMS manager, locate and review 5 major trade or government projects fostering quality improvement projects.

Module 3: Domains of a QI System

After completing this module, you will be able to:

1. Define the 3 domains of quality improvement in EMS.
2. Identify the 3 components of EMS quality management.
3. Apply a strategy for each domain of quality.
4. Apply an appropriate technique to the proper domain of EMS quality using a given list of QI processes.
5. Differentiate the levels of measurement on outcomes for EMS patients.
6. Identify how an outcome in the system is influenced by structure or process.
7. Construct a flow chart of an EMS process within their organization using a legend of shapes and rules.

Module 4: Defining Quality

After completing this module, you will be able to:

1. Understand how to create a standard within their organization.
2. Identify quality standards in the EMS industry and profession.
3. Match organizational performance with national standards for clinical care.
4. Using a variety of management tools, diagrams and other processes, map and define quality in their processes.
5. Differentiate a performance measure, indicator and benchmark.

Module 5: Measuring Quality

After completing this module, you will be able to:

1. Recognize areas of the EMS attributes that need quality improvement activities.
2. Identify the components of a service audit.
3. Extrapolate the out-of-hospital unit-of-service model.
4. Apply a mathematical tool as a decision-making strategy for EMS QI projects.
5. Define the intervals for measuring quality.
6. Apply techniques on how to make accurate observations and measure field activities.
7. Describe the challenges of measuring EMS activities.
8. Identify how measurements can be collected from episodic points of field care.
9. Identify technology that assists in data measurement.

Module 6: Databases and Data Collection

After completing this module, you will be able to:

1. Define a database.
2. Identify databases that are used to collect EMS-related information.
3. Evaluate the applicability of the National EMS Information system to an EMS organization.
4. Recognize relational databases with EMS information.
5. Create a system that tracks a patient longitudinally through the health care system.
6. Identify how a database interacts with the GIS.

Module 7: Data and Quality Analysis

After completing this module, you will be able to:

1. Identify and calculate what the measures of central tendency are.
2. Interpret and apply test of correlation to determine causation and correlation with a set of data.
3. Identify patterns in statistics, and apply formulas to identify and interpret those patterns as significant or correlating.
4. Given a set of data, select the proper displays and ways to communicate the results or analysis of the data.
5. Distinguish between comparative and noncomparative measurement scales.
6. Describe efficient ways of ordering, analyzing and summarizing qualitative data.
7. At the end of the data analysis, designate what additional activities are needed to test, confirm and prove their validity.

Module 8: Quality Improvement Program and Project Management

After completing this module, you will be able to:

1. Describe the characteristics of a QI project or program.
2. Discuss how QI proposals are selected.
3. Identify the components of a well-designed project plan.
4. Explain how a QI project or program is controlled.
5. Develop and establish clear goals and objectives of a program or project.
6. Discuss how QI projects are scheduled and budgeted.
7. Identify the parts of an effective written project plan.

Module 9: Creating and Maintaining a Culture of Quality

After completing this module, you will be able to:

1. Apply techniques to help create a cultural change.
2. Understand how to assess culture in an organization.
3. Identify the components of a high-reliability organization.
4. Using standardized assessments, determine the attitudes and beliefs in an organization.
5. Differentiate between values, beliefs and attitudes.
6. Identify sample reward systems to promote a system of quality.
7. Recognize the components of a “just culture.”
8. Match the necessary parts to bring an organization into alignment.

Module 10: Legal Considerations and Corrective Action

After completing this module, you will be able to:

1. Describe the types of legal and regulatory influences on the quality improvement processes.
2. Identify existing statutes and laws from the various states outlining those processes that shall be utilized in the QA process.
3. Identify the statutory protections for quality improvement processes *Protected from Disclosure*.
4. Outline and list the steps necessary for remediation and due process for quality improvement.
5. Understand the regulatory and legal structures for quality improvement.
6. Identify how the legal processes progress in the discovery phase and quality improvement issues related to civil litigation *Generally protected from discovery*.
7. Discuss HIPAA events that identify the need for discipline.
8. Identify the progression of a lawsuit and the responsibilities of an EMS manager with that process.

Available text

Evans, B. E., & Lindsey, J. T. (2014). *EMS quality management and research*. Pearson. ISBN-10: 0138152810; ISBN-13: 9780138152819.

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/>

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Because of the dynamic nature of this subject material we suggest the instructor build content to include contemporary readings.

Lessons learned information sharing:

- 🔗 <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Point of contact

Dr. Jeffrey Lindsey, Coordinator FES, University of Florida, Jeffrey.lindsey@ufl.edu

Course outline

- I. Background and Significance of EMS Quality Control and Improvement.
 - A. Recognizing the Need for Quality Control Measures.
 - B. Recognizing the Current State of Medical Errors.
 - C. Components of a Quality Control Program.
 - D. Sources of Data and Information Related to Quality Control and Improvement.
- II. History of Quality Control and Improvement.
 - A. Significant Motivators of the Quality Assurance Movement.
 - B. Government Structures that Support Quality Control and Improvement Programs.
 - C. Key Indicators and Data Acquisition.
 - D. Quality Control in Community Risk Reduction.
- III. Domains of Quality Control.
 - A. 3 Domains of Quality Improvement in EMS.
 1. Workforce.
 2. Fleet.
 3. Data.
 - B. 3 Components of Quality Management in EMS.
 1. Retrospective.
 2. Concurrent.
 3. Prospective.
 - C. Outcomes-Based Measurements.
- IV. Creating Quality-Based Programs in Organizations

Foundations of EMS Systems (C0297)

Course description

An overview of the design and operation of EMS systems, delivery of services and the echelons of care. The history of EMS, the interface of public and private organizations, and review of the various personnel who comprise these systems will be examined in relation to their impact on the health care delivery system.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Define EMS system.
2. List the 15 components on the 14 attributes of EMS systems.
3. Recall important milestones in the evolution of EMS.
4. Describe the federal role in EMS.
5. Describe the role of state government in EMS.
6. Identify laws and legislation associated with EMS.
7. Describe the levels of prehospital care providers.
8. Describe medical oversight.
9. Identify various configurations of EMS delivery systems.
10. Summarize the recommendations and findings in "EMS Education Agenda for the Future."
11. State the role of public education and prevention in EMS.
12. Describe the role of EMS in disasters.
13. State the role of communications and communications technology in EMS.
14. Identify the fundamentals of emergency medical dispatching.
15. Describe the sources of EMS funding.
16. Describe the role of information systems and evaluation in EMS.
17. Summarize the role of research in EMS.

Available texts

Brennan, J., & Krohmer, J. (Eds.). (2006). *Principles of EMS systems* (3rd ed.). Jones & Bartlett Learning. ISBN: 9780763733827. <https://www.psglearning.com/catalog/productdetails/9780763733827>

Walz, B., & Zigmont, J. (2017). *Foundations of EMS systems* (3rd ed.). Jones & Bartlett Learning. ISBN: 9781284041781. <https://www.psglearning.com/fire/science/productdetails/9781284041781>

Supporting references/research for faculty and students

Compton, D., & Granito, J. A. (Eds.). (2002). *Managing fire and rescue services* (3rd ed.). International City/County Management Association. ISBN-13: 978-0873261289; ISBN-10: 0873261283. <https://www.amazon.com/Managing-Rescue-Services-Municipal-Management/dp/0873261283>

USFA publications: <https://apps.usfa.fema.gov/publications/>

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

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- <https://apps.usfa.fema.gov/publications/>

Journal of Emergency Medical Services Prehospital and Disaster Medicine Prehospital Emergency Care

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Point of contact

Bruce Walz, Ph.D., UMBC, 410-455-3223, walz@umbc.edu

Course outline

- I. Introduction to EMS Systems.
 - A. Components of an EMS.
 - B. EMS Agenda for the Future.
- II. History of EMS.
 - A. Pre-Industrial Period.
 - B. Industrial Period.
 - C. Modern Era.
- III. Legislation and Regulation.
 - A. Federal Role.

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- B. State Role.
 - IV. Human Resources.
 - A. Prehospital Providers.
 - B. Hospital-Based Providers.
 - C. Others.
 - D. Sources of Providers.
 - E. Provider Stress.
 - V. Transportation.
 - A. Service Providers.
 - B. Delivery Systems.
 - C. Staffing.
 - D. Vehicles.
 - E. Air Medical.
 - F. Equipment.
 - VI. Medical Oversight.
 - A. Historical Background.
 - B. Models.
 - C. Regulation and Legislation.
 - VII. Educational Systems.
 - A. Historical Background.
 - B. National Standard Curriculum.
 - C. EMS Education for the Future.
 - D. National Registry.
 - E. Settings for EMS Education.
 - F. Provider Courses.
 - VIII. Public Education.
 - A. Public Education.
 - 1. Forms of Public Education.
 - 2. Benefits of Public Education.
 - B. Public Education Process.
 - IX. Prevention.
 - A. Injury Process.
 - B. Injury Event.
 - C. Injury Types.
 - D. Injury Prevention Concepts.
 - X. Public Access.
 - A. Public Access.
 - B. Call Processing.
 - C. Non-Emergency Access Numbers.
 - XI. Communications.

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- A. Role of Communications.
 - B. Role of Dispatcher.
 - C. Systems Communication Technology.
- XII. Disasters.
- A. Types of Disasters.
 - B. Disaster Mitigation.
 - C. Hazards.
 - D. Incident Command System.
- XIII. Clinical Care.
- A. History of Clinical Care.
 - B. Categorization and Designation.
 - C. Trauma Care.
 - D. COBRA Legislation.
 - E. Critical Care Transport.
- XIV. Information Systems.
- A. Strategic Information Planning.
 - B. Information System Design.
 - C. Information System Integration.
 - D. Data Formats.
- XV. System Finance.
- A. System Organization.
 - B. Sources of Funds.
 - C. Accounting and Budgeting.
- XVI. Evaluation.
- A. Quality and Performance Evaluation.
 - B. Measuring Performance.
 - C. High Performance Systems.
- XVII. Research.
- A. Benefits of Research.
 - B. Introduction to Scientific Method.
 - C. Research Design.
 - D. The Research Study.

Community Risk Reduction in EMS (C0298)

Course description

This is an upper-level baccalaureate course for students interested in public information and community relations in EMS. This course introduces the EMS professional to benefits of community information and community relations. Students explore issues in marketing, crafting the message, identifying the audience, developing programs and creating press releases.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Demonstrate an understanding of community risk reduction as it pertains to EMS.
2. Explain the various components of a community risk-reduction program as it pertains to EMS including:
 - a. Analysis.
 - b. Public health.
 - c. Identification.
 - d. Program development.
 - e. Results measurement.
3. Discuss the benefits of a risk-reduction program in the community as it pertains to EMS.

Course objectives

Module 1: Overview of Injury Prevention

After completing this module, you will be able to:

1. Discuss the history of injury prevention.
2. Explain injury prevention countermeasures.
3. Discuss the epidemiology of injuries.

Module 2: Categorizing Injuries

After completing this module, you will be able to:

1. Discuss unintentional injury, including:
 - a. Motor vehicle accidents.
 - b. Falls.
 - c. Poisonings.
 - d. Fires and burns.
 - e. Drowning.
 - f. Asphyxiation.
 - g. Sports and recreational injuries.
 - h. Occupational injury.

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2. Discuss intentional injury, including:
 - a. Self-inflicted violence.
 - b. Homicide.
 - c. Violence.
 - d. Sexual assault.
 - e. Child abuse.
 - f. Elder abuse.

Module 3: Injury Prevention Program Development

After completing this module, you will be able to:

1. Explain the general principles of injury prevention.
2. Describe educational strategies.
3. Describe environmental strategies.

Module 4: Policy and Resource Development

After completing this module, you will be able to:

1. Discuss injury prevention laws.
2. Explain the role of advocates.
3. Describe community partners.
4. Discuss state and federal players.

Module 5: Injury Surveillance

After completing this module, you will be able to:

1. Define real-time surveillance.
2. Provide examples of information sources.
3. Discuss how to provide information to the public.
4. Discuss access to patients.
5. Discuss reporting patterns.

Module 6: Public Health

After completing this module, you will be able to:

1. Explain health promotion.
2. Discuss the role in immunization.
3. Describe surveillance.
4. Describe their role in public education.
5. Describe their role in home health care.

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6. Describe their role in behavioral health care.
 7. Describe their role in environmental health.
 8. Discuss the functions of the health department.

Module 7: Public Health Community

After completing this module, you will be able to:

1. Discuss the various associations.
2. Describe the role of the U.S. Department of Health and Human Services.
3. Compare and contrast EMS and public health.

Module 8: Assessment of Injury Prevention Program

After completing this module, you will be able to:

1. Discuss benefits of data collection.
2. Describe risk assessment.
3. Explain cost versus benefit.
4. Discuss an evaluation of program.

Available text

Lindsey, J. T., & Monosky, K. A. (2015). *EMS community risk reduction*. Pearson. ISBN-13: 978-0-13-502473-7.

Supporting references/research for faculty and students

National Fire Academy. *Risk reduction in the community*.

Vision 20/20. (n.d.). *Community risk reduction for fire department leaders*. <http://strategicfire.org/community-risk-reduction/training-materials-and-videos/>

USFA publications: <https://apps.usfa.fema.gov/publications/>

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

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NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Because of the dynamic nature of this subject material we suggest the instructor build content to include contemporary readings.

Lessons learned information sharing:

-
- <https://www.hsdll.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
 - <https://apps.usfa.fema.gov/publications/>

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Point of contact

Dr. Jeffrey Lindsey, Professor EMS, St. Petersburg College/NAEMSE rep.
jtlindsey1@aol.com

Course outline

- I. Overview of Injury Prevention.
 - A. Discuss the History of Injury Prevention.
 - B. Explain Injury Prevention Countermeasures.
 - C. Discuss the Epidemiology of Injuries.
- II. Categorizing Injuries.
 - A. Discuss Unintentional Injury, including:
 1. Motor Vehicle Accidents.
 2. Falls.
 3. Poisonings.
 4. Fires and Burns.
 5. Drowning.
 6. Asphyxiation.
 7. Sports and Recreational Injuries.
 8. Occupational Injury.
 - B. Discuss Intentional Injury, including:
 1. Self-inflicted Violence.
 2. Homicide.
 3. Violence.
 4. Sexual Assault.
 5. Child Abuse.
 6. Elder Abuse.
- III. Injury Prevention Program Development.
 - A. Explain the General Principles of Injury Prevention.
 - B. Describe Educational Strategies.
 - C. Describe Environmental Strategies.
- IV. Policy and Resource Development.
 - A. Discuss Injury Prevention Laws.
 - B. Explain the Role of Advocates.
 - C. Describe Community Partners.
 - D. Discuss State and Federal Players.
- V. Injury Surveillance.

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- A. Define Real-Time Surveillance.
 - B. Provide Examples of Information Sources.
 - C. Discuss How to Provide Information to the Public.
 - D. Discuss Access to Patients.
 - E. Discuss Reporting Patterns.
- VI. Public Health.
- A. Explain Health Promotion.
 - B. Discuss the Role in Immunization.
 - C. Describe Surveillance.
 - D. Describe Their Role in Public Education.
 - E. Describe Their Role in Home Health Care.
 - F. Describe Their Role in Behavioral Health Care.
 - G. Describe Their Role in Environmental Health.
 - H. Discuss the Functions of the Health Department.
- VII. Public Health Community.
- A. Discuss the Various Associations.
 - B. Describe the Role of the U.S. Department of Health and Human Services.
 - C. Compare and Contrast EMS and Public Health.
- VIII. Assessment of Injury Prevention Program.
- A. Discuss Benefits of Data Collection.
 - B. Describe Risk Assessment.
 - C. Explain Cost Versus Benefit.
 - D. Discuss an Evaluation of Program

EMS (Non-Core)

EMS Education (C240)

Course description

This is an upper-level baccalaureate course for students interested in the theory and practice of EMS education.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Describe principles of EMS education.
2. Describe the philosophical foundations of EMS education.
3. Describe principles of ethics, standards and legal considerations in EMS education.
4. Describe the types of EMS education programs.
5. Identify the traits and needs of learners.
6. Define the psychology of learning.
7. Describe strategies for educational planning and curriculum development.
8. Describe strategies for determining and communicating educational needs.
9. Define instructional goals and competencies.
10. Describe strategies for packing the EMS education program.
11. Discuss how to evaluate an EMS education program.
12. Describe principles of educational measurement.
13. Describe principles of student evaluation and remediation.
14. Discuss how to use educational materials and media.
15. Describe principles of lesson planning.
16. Describe principles of instructional strategies and methodology.
17. Describe strategies for classroom management.
18. Describe strategies for laboratory, clinical and field internship instruction.
19. Describe principles of EMS education in the academic setting.
20. Explain the importance of professional development.

Course objectives

Module 1: The Context of EMS Education

After completing this module, you will be able to:

1. Discuss the scope of adult education as a discipline.
2. Discuss the relationship between adult education, higher education and EMS education.
3. Describe documents that have contributed to the development of EMS education.
4. Describe the entry-level competencies for EMS educators.

Module 2: Philosophical Foundations of EMS Education

After completing this module, you will be able to:

1. Explain the value of studying education philosophy.
2. Describe the basic frameworks of progressive education and humanistic education.
3. Provide examples of learning activities that are consistent with the principles of progressive education and humanistic education.
4. Discuss how elements of progressivism and humanism can be incorporated into the competency-based National EMS Education Standards.-

Module 3: Ethics, Standards and Legal Considerations in EMS Education

After completing this module, you will be able to:

1. List national, state and local regulations, policies and procedures related to EMS education programs.
2. Defend the need for national, state and local guidelines for EMS education programs.
3. Discuss federal, state and local laws that affect the EMS teaching profession and educational institutions.
4. Discuss legal considerations regarding copyright and intellectual property issues.
5. Define liability and negligence as related to standards of instruction.
6. Discuss areas of legal liability and risk-management consideration for the student, instructor and educational institution.
7. Explain the importance of confidentiality of student information.
8. Differentiate between ethics and morals.
9. Compare theories of morality as they relate to human development and conduct.
10. Discuss the NEA Code of Ethics.
11. Provide examples of ethical instructor conduct.

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12. Provide examples of unethical instructor conduct.
 13. Describe ethical role models in the classroom, lab, clinical and field internship settings of EMS education.
 14. Discuss how ethics can be incorporated into EMS curricula.
 15. Explain why instructors should adhere to the principles of ethical and legal conduct.

Module 4: Institutions, Settings and Types of EMS Education Programs

After completing this module, you will be able to:

1. Describe the different settings in which the EMS instructor may practice.
2. Differentiate between primary, refresher and continuing EMS education.
3. Describe the purpose of traditional classroom, laboratory, clinical, field internship, online and virtual classroom EMS education.
4. Qualities, competencies, roles and responsibilities of EMS instructors.
5. Discuss the effective traits and professional competencies required of an EMS instructor.
6. Define the roles and responsibilities of an EMS instructor.
7. Differentiate between the roles and responsibilities of primary and secondary EMS instructors.
8. Explain the importance of continuing professional development in EMS education.
9. Describe pathways for continuing professional development.
10. Discuss how an EMS instructor can affect a positive relationship with students, other instructors, staff, the program director and the medical director.
11. Identify resources for EMS educational research.

Module 5: The Traits and Needs of Learners

After completing this module, you will be able to:

1. Define learning style.
2. Define learning preference.
3. Discuss how to categorize learning styles.
4. Describe teaching methods and learning activities that advocate the students' learning style.
5. Discuss how to challenge weaknesses associated with a given learning style.
6. Discuss the impact of personality type on learning styles and preferences.
7. Identify resources for measuring students' learning styles and preferences.

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8. Discuss the instructor's own learning style and its impact on teaching.
 9. Describe the characteristics of adult learners.
 10. Compare learning styles and preferences.
 11. Integrate theories of motivation into planning, teaching, evaluation and counseling activities.
 12. Discuss how cultural background can influence the learner's perceptions and expectations.
 13. Discuss how to create cultural awareness in EMS education.

Module 6: The Psychology of Learning

After completing this module, you will be able to:

1. Define learning.
2. Describe the concepts of progressivism and constructivism as related to learning.
3. Describe the roles of working memory and long-term memory in learning.
4. Discuss how the role of experience relates to learning.
5. Describe the importance of reflection on experience.
6. Describe the usefulness and limitations of models of learning.
7. Define the 3 domains of learning.
8. Provide examples of activities related to each domain of learning.

Module 7: Educational Planning and Curriculum Development

After completing this module, you will be able to:

1. Define curriculum.
2. List the components of a curriculum.
3. Define competency-based education.
4. Synthesize a planning model in developing a curriculum.
5. Discuss how to synthesize the National EMS Education Standards to develop EMS curricula.
6. Discuss how to implement a systematic approach to EMS program planning.

Module 8: Determining and Communicating Educational Needs

After completing this module, you will be able to:

1. Explain the importance of conducting a needs analysis/assessment for an EMS education program.
2. Explain the importance of conducting job/occupational/practice analysis as the basis for determining educational competencies.
3. Explain the importance of performing a task analysis when teaching psychomotor skills.
4. Conduct a needs analysis/assessment for an EMS educational program.
5. Conduct a task analysis for a selected psychomotor skill.
6. Explain the importance of a training proposal.
7. Create a training proposal.

Module 9: Instructional Objectives

After completing this module, you will be able to:

1. Define goals.
2. Define competencies.
3. Define objectives.
4. Explain the relationship between goals, competencies and objectives.
5. Explain the relationship between objectives, lesson plan content, teaching-learning activities and evaluation.
6. Discuss how to select the appropriate level and domain when writing objectives.
7. Create a set of objectives for a given competency.
8. Discuss how a teaching-learning activity or test item reflects the behavior identified by an objective.
9. Explain the importance of developing writing skills and understanding instructional objectives.

Module 10: Packaging the EMS Education Program

After completing this module, you will be able to:

1. Discuss how to formulate credit hours.
2. Describe formats for delivering EMS programs.
3. Discuss how to obtain continuing education credits.
4. Create a syllabus for an EMS course.
5. Create a syllabus for an EMS program.

Module 11: EMS Education Program Evaluation

After completing this module, you will be able to:

1. Explain the purpose of an EMS course evaluation.
2. Explain the purpose of an EMS program evaluation.
3. List the content of a course evaluation.
4. List the content of a program evaluation.
5. Differentiate between methods of evaluation and evaluation tools.
6. Distinguish between formal and informal evaluations.
7. List methods and tools for assessing an EMS educational program.
8. Create a plan for a program evaluation.

Module 12: Educational Measurement

After completing this module, you will be able to:

1. Differentiate between a norm-referenced and criterion-referenced evaluation.
2. Distinguish between reliability and validity.
3. Discuss the relationship between reliability and validity.
4. Define cut score.
5. Discuss how to calculate descriptive statistics for examinations.
6. Discuss how to assign grades.
7. Compare quantitative and qualitative methods of student evaluation.
8. Explain the importance of a table of specifications for an examination.
9. Create a table of specifications for a selected examination.
10. Discuss how to reduce evaluation-related student anxiety.
11. List considerations for administering an examination.

Module 13: Student Evaluation and Remediation

After completing this module, you will be able to:

1. Discuss the benefits of using specific types of assignments and evaluation items.
2. Differentiate between the method of evaluation and the evaluation instrument.
3. Define inter-rater reliability.
4. Describe instruments used for clinical, affective, psychomotor and integration exercise evaluations.

Module 14: Instructional Materials and Media

After completing this module, you will be able to:

1. Distinguish between high- and low-quality teaching and learning resources.
2. List the types of instructional materials.
3. List the types of instructional media.
4. Discuss how to select instructional materials and media.
5. Describe the benefits to using audiovisual materials.
6. Discuss how to effectively use instructional materials and media.
7. Compare the advantages and disadvantages of audiovisuals.

Module 15: The Lesson Plan

After completing this module, you will be able to:

1. Discuss the importance of using a lesson plan.
2. List the components of a lesson plan.
3. Describe the components of a lesson plan.
4. Create a lesson plan.

Module 16: Instructional Methodology

After completing this module, you will be able to:

1. Compare methods of instruction: uses, advantages and disadvantages.
2. Prepare an instructional method based on student learning needs.
3. Create notes for lectures and discussions.
4. Discuss how to relate principles of effective communication to the teaching-learning transaction.
5. Deliver an EMS subject matter presentation.
6. Discuss how to use questions to facilitate discussion.
7. Describe activities that support student learning.
8. Describe case-based instruction.
9. Describe computer-based instruction.

Module 17: Classroom Management

After completing this module, you will be able to:

1. List the characteristics of a positive learning environment.
2. List the types of dysfunctional student behaviors.
3. Discuss how to formulate a plan for resolving a given student problem.
4. Discuss how to role-model positive classroom behaviors.
5. Describe strategies to maintain group order and productivity.
6. Describe strategies to encourage student participation.
7. Discuss how to relate theories of motivation to student behavior.
8. Discuss how to mitigate dysfunctional student behavior.
9. Describe barriers to student motivation.
10. Describe strategies to mitigate barriers to student motivation.

Module 18: Considerations in Laboratory, Clinical and Field Internship Instruction

After completing this module, you will be able to:

1. Describe considerations for the administration of laboratory, clinical and field internship activities.
2. Describe strategies and methodologies for instruction.
3. Discuss how to create simulation scenarios.
4. Describe the purpose of clinical and field internship education.
5. Discuss why preceptor training is important.
6. Discuss how to conduct laboratory, clinical and field internship learning.

Module 19: EMS Education in the Academic Settings

After completing this module, you will be able to:

1. Describe the organizational structure of EMS education in the academic settings.
2. Describe the roles and responsibilities of administrative personnel in the EMS academic setting.
3. Describe the roles and responsibilities of EMS faculty.

Module 20: Professional Development

After completing this module, you will be able to:

1. Discuss the importance of professional development.
2. Discuss the importance of belonging to professional organizations.
3. Discuss the importance of attending conferences and other professional activities.
4. Discuss the importance of undergraduate and/or graduate education.
5. Discuss how to engage in networking.
6. Discuss the importance of creating and maintaining a professional portfolio.
7. Discuss the importance of research, writing and presenting in professional development.

Available texts

Alexander, M. (2006). *Foundations for the practice of EMS education*. Pearson. ISBN-10: 0-13-119435-6; ISBN-13: 978-0-13-119435-9.

McClincy, W. (2011). *Instructional methods for public safety*. Jones & Bartlett. ISBN: 9780763776084. <https://www.psglearning.com/ems/continuinged/productdetails/9780763776084>

National Association of EMS Educators. (2013). *Foundations of education: An EMS approach* (2nd ed.). Delmar, Cengage Learning. ASIN: B00BTM2TOI, <https://www.amazon.com/Foundations-Education-Approach-Association-Educators/dp/B00BTM2TOI>

Supporting references/research for faculty and students

National Association of EMS Educators: www.naemse.org

National EMS Education Standards: www.ems.gov/pdf/education/National-EMS-Education-Standards-and-Instructional-Guidelines/EMR_Instructional_Guidelines.pdf

USFA publications: <https://apps.usfa.fema.gov/publications/>

Applied research: Agency research: <http://www.usfa.fema.gov>

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NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hsdl.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

Assessment

The students will be evaluated for mastery of the learning objectives course competencies by methods of evaluation to be determined by the instructor.

Points of contact

Dr. Jeffrey Lindsey, PhD, University of Florida, Gainesville, Florida/NAEMSE rep.
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EMS Communications Management (C0242)

Course description

This is an upper-level baccalaureate course for students interested in the management of an EMS Communications system. This course introduces the EMS professional to the communications systems and methodologies available to governmental and private EMS providers. Students explore issues in EMS Communications technology, software, data management and physical plant considerations.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Draw an organizational matrix that is representative of the anatomy of Emergency Medical Communications.
2. Demonstrate the communication role of emergency medical services from field application to the emergency department.
3. Identify the common terminology used by emergency medical services technicians and paramedics during emergency field operations.
4. Evaluate the role of GIS mapping and enhanced 911 systems.
5. List the various state and federal regulations that affect the Emergency Medical Communications.
6. Describe the role of the call dispatcher as it applies to prehospital emergency medical care.
7. List and describe techniques for relaying clear, effective EMS communications.
8. Identify the technical aspect of how basic radio systems work for use in the public radio system and how they are licensed.
9. Articulate the foundational security concepts and best practice principles of analog and digital public radio systems.
10. Compare and contrast “right to know” information and protected personal and personally identifiable information.

Course objectives

Module 1: History of EMS Communications

At the end of this module, you will be able to:

1. Chronicle the development of a single universal call number to access emergency assistance.
 - a. Internationally.
 - b. Nationally.
 - c. Locally.

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2. Discuss the significance of White House Office of Telecommunications National Policy Bulletin 73-1.
 3. Discuss the evolution of 911 as a single call access number to selective routing providing phone and location services.

Module 2: Processing Calls for Service

At the end of this module, you will be able to:

1. Differentiate the benefits and weaknesses of commercially available call processing Emergency Medical Dispatch programs, such as Medical Priority Dispatch System and the APCO Criteria-Based Dispatch protocol.
2. Compare and contrast their usage with the benefits and weaknesses of an internally developed community program as needed.
3. Develop a training curriculum for the EMD program utilized or selected by the community.

Module 3: Dispatching Calls for Service

At the end of this module, you will be able to:

1. Compare and contrast the commercially available call processing and computer-aided dispatch programs.
2. Identify the advantages and disadvantages of utilizing a particular program for a community, ranging from rural, suburban, urban, metro city-sized and regional centers.
3. Identify the System Status Management Plan for a community, and discuss modifications if needed.
4. Discuss priorities of balancing contractually obligated consumers and handling emergency calls for service.

Module 4: Telephony Infrastructure

At the end of this module, you will be able to:

1. Understand the interrelationships between the CLEC and PSAP in relationship to emergency call routing to the emergency call center in regards to call trunking.
2. Identify the routing of the caller utilizing a 3-digit emergency access number to their CLEC and then PSAP and subsequent secondary PSAP's.
3. Articulate the advantages and disadvantages of how a caller may access emergency services when using a hardwired landline versus a phone system utilizing Voice over Internet Protocol (VOIP) and/or wireless phone sets.
4. Discuss the use of selective routing in a community and how to properly manage the feature to ensure equal access to emergency service.
5. Discuss the challenges of properly geolocating a wireless caller according to the latest FCC docket for wireless access to 911.

Module 5: Radio Infrastructure

At the end of this module, you will be able to:

1. Discuss the different public safety frequencies allocated in the 700-mHz, 800-mHz and 900-mHz frequency bands.
2. Discuss the commercial VHF and UHF analog frequency bands available to commercial EMS providers.
3. Discuss the strengths and weaknesses of a trunked versus non-trunked radio system.
4. Articulate the importance of radio interoperability and system design as it relates to APCO P25 and Department of Homeland Security directives regarding emergency radio interoperability.
5. Compare and contrast the use of radio equipment made by different manufacturers.
6. Discuss the use of wireless handsets with direct-call capabilities versus radio handsets.
7. Compare and contrast the utilization of hardwired data cables versus microwave data links to connect base stations to the EMS Communications Center.
8. Develop a communications plan for the center for normal operations.
9. Develop a communications plan for the center for disaster operations.
10. Develop a communications plan for the center for special event operations.

Module 6: Information Network Infrastructure

At the end of this module, you will be able to:

1. Identify the priorities when directing the development and/or selection of the network software for the EMS Communications Center's data network.
2. Properly identify the security priorities when directing the development of a network security plan to prevent access by unauthorized users.
3. Articulate the federal, state and local regulations governing the data security of an emergency call center.

Module 7: Physical Plant

At the end of this module, you will be able to:

1. Be able to articulate the need for redundant systems in telephony, radio infrastructure, information network services and software.
2. Be able to identify the proper backup systems for mission-critical programs in the center.
3. Discuss the need to properly select call center furniture and call processing workstations for personnel in compliance with federal, state and local regulations.
4. Discuss the process to ensure that the communications center is safe from natural disasters, such as earthquake, tornado, flooding, hurricane and acts of terrorism.
5. Develop contingency plans for extended operations in the event of a significant event.

Module 8: Quality Assurance/Quality Improvement

At the end of this module, you will be able to:

1. Articulate the priorities and essential qualifications for medical direction of an EMS Call Center.
2. Develop the duties and responsibilities of the EMS Call Center medical director.
3. Develop policies and protocols to ensure the confidentiality of the EMD QA/QI process.
4. Develop policies and protocols to reflect local employment regulations and/or collective bargaining agreements in relationship to the EMD QA/QI performance improvement process.
5. Discuss the advantages and disadvantages of commercially available EMS QA/QI programs.
6. Develop a risk-management protocol for the EMS Communications Center as it relates to call taking, call processing and call dispatching.

Module 9: Regional Coordination

At the end of this module, you will be able to:

1. Identify the relationship of the local EMS Communications Center with the local/county Emergency Operations Center.
2. Identify the relationship of the EMS Communications Center to other emergency communication centers in the community.
3. Articulate the differences in a consolidated regional EMS Communications Center versus separate centers.
4. Discuss the benefits and disadvantages of consolidated regional EMS Communications Centers versus separate centers.
5. Discuss the relationship of the local EMS Communications Center with a Regional Emergency Operations Center (REOC).
6. Discuss the relationship of the local EMS Communications Center with a State Communication/Coordination Center.

Available text

Steele, S. B. (1992). *Emergency dispatching: A medical communicator's guide*. Pearson. ISBN: 9780893038359. https://www.amazon.com/Emergency-Dispatching-Medical-Communicators-Guide/dp/0893038350/ref=sr_1_fkmrnull_1?keywords=emergency+dispatching%3A+a+medical+communicator%27s+guide&qid=1557498670&s=gateway&sr=8-1-fkmrnull

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/>

Applied research: Agency research: <http://www.usfa.fema.gov>

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NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- <https://www.hsdl.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- <https://apps.usfa.fema.gov/publications/>

Because of the limited textbook availability and dynamic nature of this subject material, we suggest the instructor build content to include contemporary readings.

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Point of contact

Sebastian Wong BA EMT-P, Adjunct Faculty, Las Positas College, Livermore, California
<mailto:sewong@laspositascollege.edu>

Finance of EMS Systems (C0243)

Course description

This is an upper-level baccalaureate course for students interested in the practice and principles of emergency medical services systems finance and budget and the processes that contribute to assets and liabilities of an emergency medical service system. This course introduces the EMS professional to topics to include but are not limited to budgeting, auditing, billing, risk financing and internal auditing.

Prerequisites

None.

Course outcomes

EMS Management will expose the participant to the variety of practices utilized in long- and short-term system financing of an EMS agency. Participants will effectively demonstrate the principals and applications of finance management to organizations in general, and to EMS organizations in particular.

Upon completion of this course, you will be able to:

1. Demonstrate an understanding of areas and responsibilities related to financing an EMS system.
2. Identify the importance of additional funding resources, such as EMS billing, grant preparations and other available revenues.
3. Define the fundamental components within a budgeting process, such as research, analysis, calculation and forecast budgeting.
4. Communicate budgetary and financial information in various written documents including the creation of financial reports.
5. Evaluate a company's proposal contract to determine the significance involving future revenue.
6. Develop a request for proposal (RFP) involving a significant capital EMS purchase, including an oral or electronic media presentation of a budgetary or financial request.

Course outline

Module 1: Accounting Conventions

At the end of this module, you will be able to:

1. Identify and use financial statements and reports.
2. Define a balance sheet.
3. Build an income statement.
4. Identify cash flow.
5. Discuss accrual accounting.

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6. Describe a cash flow cycle.
 7. Conduct a cash flow analysis.
 8. Define policies for managing finance.

Module 2: Accounting Discipline

At the end of this module, you will be able to:

1. Define public accounting.
2. Differentiate governmental accounting.
3. Define management accounting.
4. Compare and contrast tax and financial accounting.
5. Identify cost accounting.
6. Explain cost management.
7. Discuss operational management.

Module 3: Accounting Principles

At the end of this module, you will be able to:

1. Define principles of regularity.
2. Define principles of consistency.
3. Define the principle of sincerity.
4. Define the principle of the permanence of methods.
5. Define the principle of non-compensation.
6. Define the principle of prudence.
7. Define the principle of continuity.
8. Discuss marginalism.
9. Apply consistency to an EMS financial program.
10. Identify matching.
11. Apply cash accounting procedures.
12. Explain prepaid expenses.

Module 4: Inventory Control

At the end of this module, you will be able to:

1. Identify procedures for determining inventory.
2. Discuss ordering cost.
3. Define procedures for economic ordering quantity.

Module 5: Depreciation

At the end of this module, you will be able to:

1. Describe straight line depreciation.
2. Differentiate declining balance from straight line depreciation.
3. Discuss sum of the year.

Module 6: Role of Finance

At the end of this module, you will be able to:

1. Explain criteria for financial management.
2. Define the following economic concepts:
 - a. Microeconomics.
 - b. Macroeconomics.
 - c. Supply and demand.
 - d. Cost-benefit analysis.
 - e. Interest rates.
 - f. Present and future value of money.

Module 7: Role of Finance

At the end of this module, you will be able to:

1. Define allocation of resources.
2. Explain and model.
3. Forecasting.
4. High-end and low-end forecasting.
5. Forecasting models.

Module 8: Financial Decision-Making

At the end of this module, you will be able to:

1. Explain territory and finance.
2. Discuss sensitivity testing.
3. Describe a break-even analysis.
4. Discuss how to measure uncertainty.
5. Explain cash management.
6. Discuss working capital.
7. Write a cash budget.
8. Explain idle cash.
9. Provide examples of long-term debt financing.

Module 9: Budgeting

At the end of this module, you will be able to:

1. Describe traditional budgeting activities.
 - a. Financial planning and control.
 - b. Working capital.
2. Define operational revenue.
3. Compare and contrast expenses and costs.
4. Differentiate between the 4 types of budgets:
 - a. Incremental budgets.
 - b. Priority incremental budgets.
 - c. Line-item budgets.
 - d. Zero-based budgets.
5. Describe a capital budget process.
6. Project cash flow and risk.

Module 10: Purposes and Benefits of a Master Budget

At the end of this module, you will be able to:

1. Explain how this guides performance.
2. Identify the limitations of a master budget.
3. Discuss assumptions of a master budget.
4. Prepare a master budget.
5. Prepare an operating budget to include:
 - a. Revenue.
 - b. Direct material.
 - c. Direct labor.

Module 11: Role of Risk Management

At the end of this module, you will be able to:

1. Explain transaction cost theory.
2. Define resource dependency theory.
3. Discuss risk sharing and the following aspects:
 - a. Reactive purchasing.
 - b. Strategic partnerships and vendors.
 - c. Competitive bidding.

Module 12: Contracts

At the end of this module, you will be able to:

1. Differentiate and discuss various contract types.
2. Identify contract execution special considerations.

Module 13: Quality Control

At the end of this module, you will be able to:

1. Define warranty.
2. Identify a waiver and its application.
3. Describe bonds.
4. Discuss breaches and their impact on business.

Module 14: Negotiation

At the end of this module, you will be able to:

1. Identify the stages of negotiation.
2. Explain negotiation tactics.
3. Discuss how to properly prepare for negotiation.

Module 15: EMS Billing Rules and Regulations

At the end of this module, you will be able to:

1. Identify Medicare and Medicaid rules and requirements.
2. Discuss the false claims act.

Module 16: Checks and Balances

At the end of this module, you will be able to:

1. Describe the auditing process.
2. Discuss accounting assurance.
3. Explain corporate governance.
4. Compare and contrast different types of audits.

Available text

Mitterer, D. M., & Lindsey, J. T. (2015). *EMS finance*. Pearson. ISBN-10: 0-13-507482-7; ISBN-13: 978-0-13-507482-4. <http://www.bradybooks.com/store/product.aspx?isbn=0135074827>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/>

Applied research: Agency research: <http://www.usfa.fema.gov>

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Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- <https://www.hsdl.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- <https://apps.usfa.fema.gov/publications/>

Because of the limited textbook availability and dynamic nature of this subject material, we suggest the instructor build content to include contemporary readings.

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Point of contact

Diane C. Flint, University of Maryland, Baltimore County <mailto:dflint1@umbc.edu>

EMS Public Information and Community Relations (C0245)

Course description

This is an upper-level baccalaureate course for students interested in public information and community relations in EMS. This course introduces the EMS professional to benefits of community information and community relations. Students explore issues in marketing, crafting the message, identifying the audience, developing programs and creating press releases.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Explain how an understanding of public information and community relations pertain to emergency medical services (EMS).
2. Describe the various components of the public information and community relations.
 - a. Marketing.
 - b. Messaging.
 - c. Audience identification.
 - d. SWOT analysis.
 - e. Press releases.
3. Describe the benefits of public information and community relations.

Course objectives

Module I: EMS Public Information, Education and Community Relations

At the end of this module, you will be able to:

1. Define the meanings and discuss the importance of public information, education and community relations.
2. Identify the target audiences to keep informed for public information, education and community relations.
3. Identify the qualities of a successful public information officer.

Module II: Principles of Marketing

At the end of this module, you will be able to:

1. Describe the core concepts of marketing.
2. Discuss how the core concepts of marketing relate to the operation of an EMS agency.
3. Identify the different marketing environments that exist within an EMS agency's jurisdiction.
4. Define SWOT analysis.

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5. Create a SWOT analysis.
 6. Discuss how to perform marketing research.
 7. Discuss how to address messages to markets.

Module III: Public Information and Education (PIE) Tool

At the end of this module, you will be able to:

1. Discuss the 4 steps of creating a Public Information and Education (PIE) Tool.
2. Adapt a model PIE Tool to a specific department in an EMS agency.

Module IV: Audience Identification

At the end of this module, you will be able to:

1. Identify the 4 main groups of target audiences.
2. Identify different audiences within each of the 4 main groups of audiences.
3. Differentiate between the roles of reporters, editors and columnists.

Module V: Categorizing Messages by Type and Audience

At the end of this module, you will be able to:

1. Recognize the different types of incoming and outgoing messaging needs in an EMS agency.
2. Match message topics and content with targeted audiences.
3. Recognize, create and capitalize on opportunities to inform and educate different target audiences.

Module VI: Craft Creating the Message

At the end of this module, you will be able to:

1. Discuss how to create content for different target audiences.
2. Discuss how to write effectively for the message delivery method chosen to be used.
3. Create a message for EMS public information, education and community relations.
4. Discuss how to use tools and techniques to blend data with other elements to improve message delivery.

Module VII: Delivering the Message

At the end of this module, you will be able to:

1. Discuss how to use different written, oral and electronic methods to effectively deliver information to audiences.
2. Discuss how to deliver an effective oral presentation.

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3. Describe strategies to maintain relationships with print and electronic media.
 4. Describe strategies in using electronic media and social networking to inform and educate target audiences.

Module VIII: Press Releases

At the end of this module, you will be able to:

1. Describe the different reasons and ways to use press releases.
2. Describe strategies for presenting a press release.
3. Identify the essential elements of a lead.
4. Describe the fundamentals of clear, effective writing.
5. Differentiate between hard news and features.

Available texts

Brown, L. (2004). *Media relations for public safety professionals*. Jones & Bartlett Learning. ISBN: 9780763731670. <https://www.psglearning.com/catalog/productdetails/9780763731670>

Giesler, M. P. (2018). *Fire and life safety educator: Principles and practice* (2nd ed.). Jones & Bartlett Learning. ISBN: 9781284041972. <https://www.psglearning.com/fire/instructor/productdetails/9781284041972>

Supporting references/research for faculty and students

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Because of the limited textbook availability and dynamic nature of this subject material, we suggest the instructor build content to include contemporary readings.

Assessment

The student will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Points of contact

Dr. Jeffrey Lindsey, Professor EMS, St. Petersburg College/NAEMSE rep. jtlindsey1@aol.com PhD, University of Florida, Gainesville, Florida: jeffrey.lindsey@ufl.edu

Robert Dotterer, BEd MEd, Paradise Valley Community College, Phoenix, Arizona: robert.dotterer@paradisevalley.edu

Management of Transport Services (C0251)

Course description

This course provides an overview of the application of management principles to the provision of transport services. It includes an analysis of the economic, geographic, temporal and clinical characteristics of ambulance demand; the key processes for providing transport services; and an evaluation of industry best practices.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Describe and analyze the economic characteristics of ambulance markets.
2. Describe the geographic and temporal characteristics of demand for transport services.
3. Evaluate the research on the clinical characteristics of EMS patients.
4. Describe the key processes for providing transport services, including techniques for producing quality services efficiently and effectively.
5. Evaluate the techniques for deploying and managing EMS resources to produce reliable and efficient response time performance.
6. Describe the best practices for the management of transport services.

Course objectives

Module 1: History of Ambulance Services and Modern Transportation Systems

At the end of this module, you will be able to:

1. Explain the origins of ambulance services in the United States.
2. Discuss the development of key components of EMS and the role played by ambulance services.
3. Describe the importance of milestones in the maturation of American EMS.
4. Explain the impact of military conflict on the creation of ambulance and emergency medical systems.
5. Identify the most important national developments that advanced EMS in the United States.
6. Summarize critical legislations that led to America's current state of EMS delivery.

Module 2: Levels of Ambulance Service

At the end of this module, you will be able to:

1. Define the 4 levels of ambulance service.
2. Identify the role that each of the levels of ambulance service could play in an EMS system.

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3. Explain the clinical and fiscal implications of deploying levels of care.
 4. Explain the potential impact of current research on patient outcomes for ALS and BLS levels of care and how that may impact future deployment of ALS and BLS ambulances.

Module 3: Corporate Models for Ambulance Delivery

At the end of this module, you will be able to:

1. Distinguish an emergency medical services system from an ambulance service.
2. List at least 5 different corporate models for the delivery of ambulance service to a community.
3. Discuss key strengths, weaknesses and attributes of each corporate model for delivery of ambulance service to a community.
4. Explain the implications of federal anti-kickback regulations.
5. Understand the relationship between ambulance service and hospital profits.

Module 4: The Ambulance Market

At the end of this module, you will be able to:

1. Describe the ambulance and medical transportation market in the United States in economic terms.
2. Explain related and overlapping markets that interact with the ambulance market.
3. Understand the approximate demand for ambulance and related services and factors that affect that demand.
4. Clarify the utility nature of the economics of the ambulance market, including economies of scale.
5. Describe the effects of market exclusivity, and discuss horizontal and vertical consolidation within the market.
6. Discuss the use of competition and the antitrust implications of creating exclusive markets.
7. Explain various common methods used for the allocation of market rights.
8. Identify the effects of federal government intervention in the ambulance market, including a description of cost shifting and its predictable results on pricing.
9. Identify a major reason that the ambulance market is likely to grow significantly over the next 20 years.
10. Discuss strategies that ambulance service providers may pursue to expand the market and access new sources of revenue.

Module 5: Medical Transportation Scheduled

At the end of this module, you will be able to:

1. Explain the difference between medical and nonmedical transportation.
2. Explain the difference between scheduled and unscheduled services.
3. Identify the role each of the different service levels plays in an ambulance service.
4. List the 3 main decision points used by facilities in choosing an ambulance provider.
5. Identify the billing implications for interfacility and intrafacility ambulance services.

Module 6: Air Ambulance and Air Medical Transportation

At the end of this module, you will be able to:

1. Define air medical services.
2. Explain the common service delivery models found in air medical services.
3. List the most common organizational models found in air medical services and describe the key attributes of each.
4. Describe the regulatory agencies involved in overseeing air medical service operations.
5. Discuss the various staffing models commonly found in air medical services response.
6. Discuss the key considerations in vehicle selection and their impact on operations.
7. Explain the unique considerations associated with a communication center that supports air medical services.
8. Describe the unique aspects of a comprehensive safety program within an air medical service operation.
9. List some of the unique technology considerations associated with an air medical service operation.
10. Describe some of the educational offerings and professional certifications available to air medical services personnel.
11. Discuss some of the key attributes of a successful air medical service marketing program.

Module 7: Deployment and Staffing Models

At the end of this module, you will be able to:

1. Explain and demonstrate basis techniques of temporal or time series demand analysis.
2. Explain the differences, advantages and disadvantages of geographic versus demand-based ambulance deployment.

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3. Define the limitations of deterministic maximal and set-coverage geospatial modeling.
 4. Explain the importance of appropriately managing “controllable” time segments, such as chute times, hospital drop times and lost unit hours.
 5. Explain the impacts of shift scheduling patterns in system efficiency, as well as any potential negative impacts to patient clinical outcomes and operations safety.

Module 8: Human Resources Administration

At the end of this module, you will be able to:

1. Provide a brief history of human resources as a profession.
2. Identify the functional (subspecialty) areas of human resources as a profession.
3. Identify legal mandates that provide the foundation for employee management.
4. Describe the importance of job descriptions and how they are used for employee management.
5. Identify and describe the selection and hiring process to include job posting, application/applicant review, interviews, background checks and job offers.
6. Identify and describe the functional life cycle of an employee to include new employee orientation, performance improvement, progressive discipline, promotion and employee departure (voluntary and involuntary).
7. Describe discipline and the process of progressive discipline.
8. Describe the process of employee mentoring and succession planning.

Module 9: Ambulance Specification and Procurement

At the end of this module, you will be able to:

1. Describe a methodology to define the desire and need for a new ambulance for an EMS agency.
2. Identify the applicable regulations for an ambulance to be credentialed and placed into service in the state and local EMS systems.
3. Discuss the limitations in the physical vehicle based on where it will be utilized and stored.
4. Identify key features that will be required inside the ambulance module to meet the operational and clinical needs of the ambulance service.
5. Identify different ambulance construction materials, and discuss techniques for identifying the specifications that best suit the needs of the ambulance service.
6. Discuss the reasons for properly specifying the electrical requirements of an ambulance.

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7. Identify the regulations that stipulate what emergency equipment, such as lights and sirens, are required or prohibited for use on ambulances. Evaluate different designs and equipment to enhance the safety of paramedics working in the ambulance and include them within the specification document.
 8. Estimate the required payload for the ambulance based on the operational and clinical needs of the ambulance service, and use this information in selecting the appropriate chassis
 9. Develop a thorough plan for inspecting an ambulance prior to delivery based on the specification and vendor build plans.

Module 10: Patient Care Reporting Documentation and Documentation Systems

At the end of this module, you will be able to:

1. Describe and discuss the functions and importance of the patient care report.
2. Demonstrate the basic requirements for adequate patient care report writing.
3. Discuss the legal and regulatory requirements related to patient care reporting.
4. Describe the impact that patient care report documentation has on billing and collection efforts.
5. Discuss the various policies and procedures that are required for patient care report administration.
6. Discuss the emergence of electronic patient care reporting systems and the benefits that these systems bring to the EMS services that utilize them.
7. List the elements necessary for the successful procurement and implementation of electronic patient care reporting systems.
8. Discuss storage and data security in the administration of patient care reporting systems.
9. Discuss developments that will impact patient care reporting and EMS documentation in the future.

Module 11: Marketing Media and Community Relations

At the end of this module, you will be able to:

1. Identify and define the various categories of organizational stakeholders.
2. Describe the importance of utilizing technology as part of effective ambulance marketing.
3. Identify the various types and methods of available marketing technology.
4. Describe various types of traditional marketing mediums.
5. Describe how to work with the press to get your message out and to provide community outreach.
6. Identify the benefits of ongoing community outreach in positioning your organization.

Module 12: Ambulance Service Dispatch and Radio Communications

At the end of this module, you will be able to:

1. Define key concepts and terms related to radio and telephone communications systems.
2. Identify key equipment utilized in ambulance communications centers.
3. Identify key components of a Public Safety Answering Point (PSAP).
4. Explain key differences between methodologies of call handling and dispatch.
5. Identify current issues regarding dispatch and radio communications, including staffing and technology.

Module 13: Technology in Support of Ambulance Operations

At the end of this module, you will be able to:

1. Identify 8 technology tools that can be used to automate and enhance ambulance operations.
2. Discuss and describe the benefits that technology tools can bring to an ambulance service.
3. Identify the needs for operational support of an ambulance service, and select the proper technology to improve specific areas of performance.

Module 14: The Finance and Accounting Operations

At the end of this module, you will be able to:

1. Describe the financial management and accounting roles and responsibilities in an organization.
2. Describe the standards and basic elements of accounting.
3. Compare and contrast cash versus accrual accounting.
4. Describe the basic financial statements and alternative names for those statements.
5. List common sources of ambulance revenue.
6. Describe the purpose of a budget.
7. Explain common ambulance productivity and financial measures.
8. List the steps in billing for ambulance service.
9. Describe the primary payment sources for ambulance services.
10. Explain common issues in ambulance billing and collections.

Module 15: The Regulatory Environment of Ambulance Operations

At the end of this module, you will be able to:

1. Describe the need for regulation of EMS.
2. Describe the objectives of regulation.
3. Compare and contrast statutes, regulations and policy.
4. List the areas of ambulance service that are regulated.
5. Describe the role of local, state and federal regulation.
6. Explain the role of nongovernmental organizations in EMS regulations.
7. List the major national EMS organizations.
8. Describe advocacy and lobbying.
9. Explain regulatory conflict.

Module 16: Legal and Compliance Issues for Ambulance Services

At the end of this module, you will be able to:

1. Create a compliance program meeting the current criteria specified by the Department of Health and Human Services, Office of the Inspector General.
2. Evaluate an existing compliance program to determine adequacy.
3. Recognize the value of having a compliance program in place.

Module 17: Safety Considerations for Ambulance Services

At the end of this module, you will be able to:

1. Identify the role of the Incident Safety Officer.
2. Explain the limitations of technology for creating a safer work environment.
3. Compare the relationship between the EMS safety officer and the ISO.
4. Describe why the investigation of a near-miss event is important.
5. Explain the difference between a regulation and a standard.

Module 18: Ambulance Service Activities in Support of the Community

At the end of this module, you will be able to:

1. Describe the range of roles that an ambulance service may play in its community.
2. Discuss the benefits to an ambulance service of taking a broad view of its role in the community.
3. List 6 areas where common processes may be beneficial to the ambulance service and the patients it serves.

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4. Discuss considerations surrounding ambulance service involvement in providing medical support to community mass gatherings.
 5. Discuss considerations involved with the provision of medical support to fire service and law enforcement special operation teams and activities.
 6. Describe the benefits to the ambulance service and the community from involvement in efforts to control illnesses, reduce injuries and provide nontraditional care to special populations in the community.

Module 19: Ambulance Operations in Support of Disaster Operations

At the end of this module, you will be able to:

1. Utilize the National Incident Management System and the Incident Command System when operationally engaged.
2. Develop the capacity to coordinate, communicate and collaborate prior to, during and following critical incidents involving ambulance services and other agencies.
3. Describe the emergency management continuum of mitigation, preparedness, response and recovery as it relates to planning of ambulance operations in a natural, technological or criminal disaster situation.
4. Delineate the elements necessary to develop and execute a successful memorandum of understanding and mutual aid agreement.
5. Conduct a needs analysis, hazard/threat survey and a gap analysis to improve the organization's potential response to a disaster.
6. Conduct a post-incident debriefing (after-action conference), and develop an after-action report and improvement plan.
7. Explain the roles and responsibilities (within the Incident Command System) of the Incident Commander in the initial phases of an incident or for the totality of a smaller incident, of the EMS branch director at larger incidents involving multiple casualties, of a division/group supervisor at an incident of any size, and of a task force/strike team leader for an out-of-jurisdiction response to a major event.

Available text

National EMS Management Association. (2015). *Management of ambulance services*. Pearson. ISBN-13: 9780135028292 . <https://www.pearson.com/us/highereducation/program/NEMSMA-Inc-Management-of-Ambulance-Services/PGM4405.html>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/>

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- <https://www.hSDL.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- <https://apps.usfa.fema.gov/publications/>

Because of the limited textbook availability and dynamic nature of this subject material, we suggest the instructor build content to include contemporary readings.

Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Points of contact

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Analytical Approaches to EMS (C0297)

Course description

This is an upper-level baccalaureate course for students interested in the practice and principles of emergency medical services systems management and the processes that contribute to the effectiveness of day-to-day operations within an EMS organization. This course introduces the EMS professional to topics that include introduction and purpose of analysis, analysis in parallel professions, problem identification, foundational analysis, data collection, financial analysis, cost-benefit analysis, policy and impact analysis, and project development.

Prerequisites

None.

Course outcomes

Upon completion of this course, you will be able to:

1. Identify the variety of data to be collected in EMS.
2. Demonstrate an understanding of the value of accurate information when performing an EMS analysis.
3. Analyze a problem, issue or growth aspect in an EMS system or organization.
4. Construct a process to address EMS issues, and determine the most appropriate course of action for improvement.
5. Prepare an effective EMS analysis report as part of a fire/EMS department's strategic planning process.

Course objectives

Module 1: Overview of Injury Prevention

At the end of this module, you will be able to:

1. Discuss the history of injury prevention.
2. Explain injury prevention countermeasures.
3. Discuss the epidemiology of injuries.

Module 2: Categorizing Injuries

At the end of this module, you will be able to:

1. Discuss unintentional injury including:
 - a. Motor vehicle accidents.
 - b. Falls.
 - c. Poisonings.
 - d. Fires and burns.
 - e. Drowning.
 - f. Asphyxiation.

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- g. Sports and recreational injuries.
 - h. Occupational injury.
2. Discuss intentional injury, including:
 - a. Self-inflicted violence.
 - b. Homicide.
 - c. Violence.
 - d. Sexual assault.
 - e. Child abuse.
 - f. Elder abuse.

Module 3: Injury Prevention Program Development

At the end of this module, you will be able to:

1. Explain the general principles of injury prevention.
2. Describe educational strategies.
3. Describe environmental strategies.

Module 4: Policy and Resource Development

At the end of this module, you will be able to:

1. Discuss injury prevention laws.
2. Explain the role of advocates.
3. Describe community partners.
4. Discuss state and federal players.

Module 5: Injury Surveillance

At the end of this module, you will be able to:

1. Define real-time surveillance.
2. Provide examples of information sources.
3. Discuss how to provide information to the public.
4. Discuss access to patients.
5. Discuss reporting patterns.

Module 6: Public Health

At the end of this module, you will be able to:

1. Explain health promotion.
2. Discuss the role in immunization.
3. Describe surveillance.

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4. Describe their role in public education.
 5. Describe their role in home health care.
 6. Describe their role in behavioral health care.
 7. Describe their role in environmental health.
 8. Discuss the functions of the health department.

Module 7: Public Health Community

At the end of this module, you will be able to:

1. Discuss the various associations.
2. Describe the role of the U.S. Department of Health and Human Services.
3. Compare and contrast EMS and public health.

Module 8: Assessment of Injury Prevention Program

At the end of this module, you will be able to:

1. Discuss benefits of data collection.
2. Describe risk assessment.
3. Explain cost versus benefit.
4. Discuss an evaluation of program.

Available texts

Babbie, E. R. (2016). *The practice of social research* (14th ed.). Cengage Learning. ISBN-13: 978-1305104945; ISBN-10: 1305104943. <http://www.cengage.com/c/the-practice-of-social-research-14e-babbie/9781305104945#compare-buying-options>

Cresswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications. ISBN-10: 1452226105; ISBN-13: 978-1452226101. <https://www.amazon.com/Research-Design-Qualitative-Quantitative-Approaches/dp/1452226105>

Supporting references/research for faculty and students

USFA publications: <https://apps.usfa.fema.gov/publications/>

Applied research: Agency research: <http://www.usfa.fema.gov>

Research reports: <https://apps.usfa.fema.gov/publications/>

Technical reports: <https://apps.usfa.fema.gov/publications/>

Topical Fire Report Series: <http://www.usfa.fema.gov/statistics/reports/>

NETC Library: <http://www.usfa.fema.gov/library/>

NIST: <https://www.nist.gov/fire> (See Publications, FIREDOC (under Publications).)

Lessons learned information sharing:

- 🔗 <https://www.hsdl.org/?search&collection=public&fct&advanced=&submitted=Search&tabsection=LLIS+Collection>
- 🔗 <https://apps.usfa.fema.gov/publications/>

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Assessment

Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor.

Points of contact

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Course outline

- I. Introduction and Purpose of Analysis.
- II. Analysis in Parallel Professions.
- III. Problem Identification, Opportunities for Growth and Public Behavior.
- IV. Foundational Analysis — Research Design and Basics.
- V. Foundational Analysis — Quantitative Research.
- VI. Foundational Analysis — Qualitative Research.
- VII. Foundational Analysis — Mixed Methods Research.
- VIII. Data Collection Methods.
- IX. Financial Analysis.
- X. Cost-Benefit Analysis.
- XI. Policy and Impact Analysis.
- XII. Putting It All Together.
- XIII. Generating the Analysis Report.
- XIV. Project Development.



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