

Fire Dynamics for the Fire Service

Course Syllabus: Four-Hour Classroom Session

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Presentation Summary:

This workshop will discuss how building geometry, materials, furnishings, ventilation, and firefighting tactics can influence fire growth and spread, leading to untenable conditions for firefighters. A combination of videos and data will describe fire behavior to characterize the thermal environment that firefighters may be exposed to. Fire behavior or fire dynamics is based on the fundamental relationship between fuel, oxygen, and heat i.e., the fire triangle. The type of fuel, the location of fuel in the room, the geometry of the fuel, building construction, and ventilation can have a significant effect on the speed of fire growth and spread. Ventilating the structure can provide cooling by removing heat, but ventilating a “fuel-rich” room may cause a flashover by allowing fresh air into the structure. It is important to remember that smoke is fuel. Ventilation does not always equal cooling. Understanding ventilation will lead to improved tactical decisions, such as when to use positive pressure ventilation.

Target Audience:

Fire service instructors, battalion chiefs, company officers, firefighters and anyone who responds to the modern fireground environment.

Objectives:

- Participants will be able to identify the various factors that make today’s fires more dangerous.
- Participants will appreciate the increased dangers to firefighters posed by the synthetic fire loads found in all fire occupancies.
- Participants will understand the increased risks to firefighters associated with hostile fire behaviors such as flashover and backdraft
- Participants will be able to identify the construction features in lightweight, energy-efficient buildings that lead to rapid fire development and hostile fire behavior.

Audio Visual Aids:

The presentation will require a computer projection system.

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What you don't know about fire behavior can kill you. Did you know that that training on fire behavior is only 1% of the total curriculums of Firefighter I, Firefighter II, Company Officer I and Company Officer II training courses. A recent firefighter line of duty death report (face 2007-28) published by the National Institute for Occupational Safety and Health (NIOSH) included the following recommendation.

Additionally standard setting agencies, states, municipalities, and authorities having jurisdiction should:

- *consider developing more comprehensive training requirements for fire behavior to be required in NFPA 1001 Standard for Fire Fighter Professional Qualifications and NFPA 1021 Standard for Fire Officer Professional Qualifications and states, municipalities, and authorities having jurisdiction should ensure that fire fighters within their district are trained to these requirements.*

If you want a reality check on the thermal conditions under which you can operate and those under which you can't, this class is a must. Improve your safety on the fireground by becoming familiar with fire behavior and learning to recognize fire conditions that favor flashover. Learn how building construction, geometry, furnishings, and ventilation can influence fire growth and spread and about the limitations of firefighter PPE and safety equipment. This is the same program that Chief Nee presented as part of the "Art and Science of Firefighting" workshop at the Fire Department Instructors Conference in Indianapolis this year.

TED NEE is a 25-year veteran of the fire service. He came up through the ranks of the Albuquerque Fire Department serving in many capacities including Battalion Chief, Director of Training and Deputy Chief of Operations before retiring in 2003. He is a senior instructor with the New Mexico Firefighter's Training Academy in Socorro, New Mexico. Ted currently works at the Sandia National Laboratory in Albuquerque, New Mexico where he is responsible for proficiency and competency training for Incident Commanders. Ted has conducted workshops and seminars on firefighting tactics for departments across the United States and Canada. Ted conducted a 1-day workshop on the "Art and Science of Firefighting" at this year's Fire Department Instructors Conference (FDIC) in Indianapolis.