



Structural Collapse Technician 2

TNG-23T

Program of Instruction

Updated: August 2009



Texas Engineering Extension Service
Urban Search and Rescue

TEEX is a member of the
National Domestic Preparedness Consortium

Course Details

Course Length: Eight days long, ten training hours each day (80 total training hours). Class is from 0700 to 1800 each day.

Delivery Location: Delivered in [Disaster City®](#), TX – within the city limits of College Station, TX or equivalent training facility.

GSA and Grant Funding Approval:

The Structural Collapse Technician 2 course is listed on GSA Schedule 84. TEEX has special registration requirements for GSA participants. Please contact the TEEX US&R Division to register for a GSA-approved course. For more information on ordering from Federal Supply Schedules, please visit: www.gsa.gov



Certificate: TEEX certificate of completion

Prerequisites: There are no prerequisites for this course.

Recommended: Prior to attending this course, participants should:

- Complete a [Collapse Rescue Operations](#) (TNG23R) course or equivalent

Due to strenuous nature of search and rescue activities, participants should secure a professional evaluation of their medical condition prior to enrolling in these courses.

Target Audience:

This course has been developed for city, state and federal urban search and responders. The target audience also includes all emergency responders from municipal and industrial agencies tasked with structural collapse duties who are seeking to hone their current shoring skills and develop advanced techniques. Course participants include emergency responders from the following five disciplines/services:

- Fire Service (FS)
- Hazardous Materials (HazMat)
- Military (MT)
- Law Enforcement (LE)
- Industrial Customers (IND)

Mission Area: Respond

Level of Training: Performance – Offensive

Required Equipment:

This course requires students to bring with them specific equipment. The course participants should arrive with the following items:

- Helmet (must be ANSI rated Z89.1 – Type 1) with headlamp
- Steel toe safety boots (must be ANSI Z41 PT99 M1/75 C/75)
- Eye protection (must be ANSI Z-87.1)
- Work gloves and kneepads
- Standard work/duty clothing including long sleeve shirts for every day of class
- Raingear suitable for search and rescue operations. Class is conducted rain or shine

NOTE: N-95 dust masks and ear plugs will be provided by TEEX

Course Overview

Course Background

The original Structural Collapse Technician course designed in the United States was Rescue Systems 1 and Rescue Systems 2, both of which were later used as the root documents for the 80 hour Structural Collapse Technician course. This course was designed to mirror the FEMA 80 hour Structural Collapse Technician course currently taught to members of the national FEMA US&R teams. Many jurisdictions have requested to receive an official FEMA structural collapse 80 hour course, however only members of one of the 28 FEMA National US&R teams can attend a FEMA sanctioned structural collapse course. To accommodate state and regional US&R teams that wish to receive the same training and standards as FEMA task force members, we began to offer this Structural Collapse Technician 2 course.

Course Description

This course is designed to provide students with the knowledge, skills and abilities to perform rescue at structural collapse scenes due to natural disaster or terrorist incidents. This course differs from the Collapse Rescue Operations course as it provides increased time to perform more in-depth skill sets as required by the FEMA US&R curriculum.

Course Purpose

The purpose of the Structural Collapse Technician 2 course is to provide jurisdictions with the same training received by the FEMA US&R Structural Collapse Technicians. This course has significant hands on labs in the Technical Skills Training Area (TSTA) and Disaster City® to ensure that students received the necessary knowledge, skills and abilities to perform exterior shoring and interior shoring operations, breaching, breaking, cutting, and burning operations, and lifting and moving techniques at structural collapse incidents. First responders completing this course will be prepared to work as a part of a team to respond to rescue situations involving structural collapses.

Course Format

Classes will begin at 7:00 a.m. each day. Participants should plan travel to arrive the night before classes begin. For the purpose of making hotel arrangements, participants could make reservations in the cities of Bryan, TX or College Station, TX. Course delivery consists of didactic instruction, participant activities, and hands-on task-oriented practical exercises. Course delivery consists of 15 percent didactic classroom presentations and lectures, and 85 percent hands-on and task-oriented practical training in both the Technical Skills Training Area (TSTA) and Disaster City®.

Students can attend the Structural Collapse Technician 2 course in two formats:

1. Open enrollment classes – TEEX offers the course on fixed dates approximately three times per. Any student meeting the prerequisites may enroll in the course online. This course typically has a broad cross section of responders and offers an excellent ability for lessons learned from other departments.
2. Contract classes – TEEX can provide this course exclusively for a jurisdiction or region. These courses must have a minimum of 10 and can have a maximum of 48 participants. When conducting contract classes, TEEX can add curriculum to meet specific requirements of the sponsoring jurisdiction.

Course Scope

The scope of this course addresses priorities and capabilities that Department of Homeland Security is encouraging state and local jurisdictions to establish. This course assists with establishing priorities for the National Planning Scenarios¹, the National Preparedness Guidelines², the Target Capabilities List³, and the Universal Task List⁴.

National Planning Scenarios

The National Planning Scenarios¹ are a reference to help federal, state, local, and tribal entities at all levels of government evaluate and improve their capabilities to perform their assigned missions and tasks in major events. This course gives a state/region the capability to conduct wide area search operations in twelve out of the fifteen National Planning Scenarios¹:

- Scenario 1: Nuclear Detonation – 10-Kiloton Improvised Nuclear Device
- Scenario 2: Biological Attack – Aerosol Anthrax
- Scenario 3: Biological Disease Outbreak – Pandemic Influenza
- Scenario 4: Biological Attack – Plague
- Scenario 5: Chemical Attack – Blister Agent
- Scenario 6: Chemical Attack – Toxic Industrial Chemicals
- Scenario 7: Chemical Attack – Nerve Agent
- Scenario 8: Chemical Attack – Chlorine Tank Explosion
- Scenario 9: Natural Disaster – Major Earthquake
- Scenario 10: Natural Disaster – Major Hurricane
- Scenario 11: Radiological Attack – Radiological Dispersal Devices
- Scenario 12: Explosives Attack – Bombing Using Improvised Explosive Devices

National Preparedness Guidelines

The National Preparedness Guidelines² defines what it means for the Nation to be prepared for all hazards. There are four critical elements of the *Guidelines*:

- (1) The ***National Preparedness Vision***, which provides a concise statement of the core preparedness goal for the Nation.
- (2) The ***National Planning Scenarios***¹, which depict a diverse set of high consequence threat scenarios of both potential terrorist attacks and natural disasters. Collectively, the 15 scenarios are designed to focus contingency planning for homeland security preparedness work at all levels of government and with private sector. The scenarios form the basis for national planning, training, exercises, and grant investments needed to prepare for emergencies of all types.
- (3) The ***Target Capabilities List***³ (***TCL***), which defines 37 specific capabilities that communities, the private sector, and all levels of government should collectively possess in order to respond effectively to disasters.
- (4) The ***Universal Task List***⁴ (***UTL***), which is a menu of some 1,600 unique tasks that can facilitate efforts to prevent, protect against, respond to, and recover from the major events that are represented by the National Planning Scenarios. It presents a common vocabulary and identifies key tasks that support development of essential capabilities among organizations at all levels.

Course Scope (continued)

The *Guidelines* establish a capabilities-based approach to preparedness. Simply put, a capability provides the means to accomplish a mission. The *Guidelines* address preparedness for all homeland security mission areas: prevention, protection, response, and recovery. A capability consists of the combination of elements required to deliver the desired outcome.

TEEX US&R courses primarily deal with the Search and Rescue (Land-Based) capabilities found within the Respond Mission Area and the outcome is: The greatest number of victims (human and, to the extent that no human remain endangered, animal) are rescued and transferred to medical or mass care capabilities, in the shortest amount of time, while maintaining rescuer safety.

In order to support a consistent nationwide approach to implementation, the Guidelines establish three capabilities-based preparedness tools and a National Preparedness System. To help correctly balance the potential threat of major events with the requisite resources to prevent, respond to, and recover from them, the *Guidelines* also includes seven national priorities. The priorities fall into two categories: overarching priorities that contribute to development of multiple capabilities, and capability-specific priorities that build selected capabilities from the TCL for which the Nation has the greatest need. **Priorities that apply to this course are highlighted in red.** The overarching priorities are:

- 4.1 Expand Regional Collaboration
- 4.2 Implement the NIMS⁶ & the National Response Framework⁵
- 4.3 Implement the National Infrastructure Protection Plan

Additionally, the National Preparedness Guidelines² has four capability specific priorities:

- 4.4 Strengthen Information Sharing and Collaboration Capabilities
- 4.5 Strengthen Interoperable and Operable Communications Capabilities
- 4.6 **Strengthen CBRNE Detection, Response, and Decontamination Capabilities – *this course specifically addresses this National Preparedness Goal priority***
- 4.7 Strengthen Medical Surge and Mass Prophylaxis Capabilities

Course Scope (continued)

Target Capabilities List

The September 2007 version of the Target Capabilities List³ (TCL) provides guidance on the specific capabilities and levels of capability that Federal, State, local, and tribal entities will be expected to develop and maintain. The TCL is designed to assist jurisdictions and agencies in understanding and defining their respective roles in a major event, the capabilities required to perform a specific set of tasks, and where to obtain additional resources if needed. The TCL is considered a “living” document that will continue to be refined over time. The TCL identifies 37 essential capabilities. The applicable tables of the Response Mission: Search and Rescue (Land-Based) – Target Capabilities (page 407 thru 419 of the September 2007 TCL) that deal with Search and Rescue are included below. **Personnel having completed the Structural Collapse Technician 2 course give jurisdictions the capabilities that are highlighted in red.**

Capability Definition

Search & Rescue (Land-Based) is the capability to coordinate and conduct search and rescue (SAR) response efforts for all hazards, including searching affected areas for victims (human and, to the extent that no humans remain endangered, animal) and locating, accessing, medically stabilizing, and extricating victims from the damaged area.

Outcome

The greatest number of victims (human, and to the extent that no humans remain endangered, animal) and rescued and transferred to medical or mass care capabilities, in the shortest amount of time, while maintaining rescuer safety.

Performance Measures and Metrics and Critical Tasks

Activity: Direct Search & Rescue Tactical Operations	
Definition: In response to notification of entrapment, provide management and coordination of SAR capability, through demobilization for single or multiple teams	
Critical Tasks	
Res.B4a 3.1	Receive and accept SAR request/activation order
Res.B4a 3.2	Participate in SAR planning process and operational briefings
Res.B4a 3	Plan and coordinate SAR operations at incident site
Res.B4a 3.4.1	Direct SAR resources according to the National Incident Management System (NIMS), the Incident Command System (ICS), and consensus-level technical rescue standards
Res.B4a 3.4.3	Determine need for deployment of additional SAR assets
Res.B4a 3.6.1	Provide timely situational awareness and response information
Res.B4a 3.6.1.1	Establish and maintain a chronological log of events in the field
Res.B4a 3.6.2	Document and collect SAR operations information, including chronological log of events in the field for use in after action review
Res.B4a 3.7.3	Re-assign/rotate technical specialists, as needed
Res.B4a 3.3.3	Maintain accountability of all SAR personnel
Res.B4a 3.2.1	Identify logistics capability of incident site to determine whether deployed SAR teams must be self-sustaining
Res.B4a 3.7	Develop SAR team reassignment/demobilization plan

Course Scope (continued)

Target Capabilities List (continued)

Activity: *Activate Search & Rescue*

Definition: In response to notification, mobilize and arrive at the incident scene to begin operations

Critical Tasks

Res.B4a 3.1	Receive and accept SAR request/activation order
Res.B4a 4.3	Participate in Search and Rescue (SAR) planning process and operational briefings
Res.B4a 4.2	Initiate mobilization procedure
Res.B4a 4.2.1	Assemble personnel and equipment at designated location
Res.B4a 4.2.2	Deploy Federal, State, regional or local SAR resources commensurate with request
Res.B4a 4.2.2	Transport team (personnel and equipment) to incident scene
Res.B4a 4.2.3	Collect and analyze incident information to assist SAR capability deployment decisions

Activity: *Provide Materiel and Other Support*

Definition: Upon arriving on scene, provide, track, and maintain equipment and supplies as well as support base of operations

Critical Tasks

Res.B4a 4.3	Participate in Search and Rescue (SAR) planning process and operational briefings
Res.B4a 5.1	Establish base of operations
Res.B4a 5.2	Maintain accountability of team equipment/supplies
Res.B4a 5.1.1	Provide medical care for SAR personnel, including the K-9 first responders

Activity: *Conduct Search and Rescue Reconnaissance*

Definition: Once on scene and equipped, provide rapid assessment of assigned SAR work areas and recommend search priorities/tactics to management.

Critical Tasks

Res.B4a 6.1.1	Assess incident site to determine search and rescue course of action
Res.B4a 6.1.2	Assess the incident site for hazardous materials (hazmat) and other environmental conditions
Res.B4a 6.1.3	Develop map of search area to be used in SAR tactical operations
Res.B4a 6.3	Communicate findings and recommend priorities to Team Management

Activity: *Search*

Definition: Upon being assigned search area, begins search operations.

Critical Tasks

Res.B4a 4.3	Participate in SAR planning process and operational briefings
Res.B4a 7.1	Ensure scene/site safety (security, shoring, debris)
Res.B4a 7.2	Conduct area search for victims
Res.B4a 7.2.1	Search for victims using canine, physical, and electronic search capabilities
Res.B4a 7.2.2	Identify and record potential/actual victim locations (live and dead)
Res.B4a 7.3	Direct ambulatory victims to safe assembly point
Res.B4a 7.4	Report progress of search efforts on a regular basis to SAR lead
Res.B4a 7.5	Maintain accountability for search personnel, equipment, and supplies

Course Scope (continued)

Target Capabilities List (continued)

Activity: *Extricate*

Definition: Upon notification of location of victim, perform extrication.

Critical Tasks

Res.B4a 4.3	Participate in SAR planning process and operational briefings
Res.B4a 7.1	Ensure scene/site safety (security, shoring, debris)
Res.B4a 8.1.1	Coordinate extrication strategy with medical personnel
Res.B4a 8.1	Extricate trapped victims
Res.B4a 8.2	Provide periodic progress reports while rescuing
Res.B4a 8.3	Maintain accountability of extrication personnel, equipment, and supplies

Activity: *Provide Medical Treatment*

Definition: Upon access to victim, coordinate with medical personnel to treat and transfer victim to more definitive medical care.

Critical Tasks

Res.B4a 4.3	Participate in US&R planning process and operational briefings
Res.B4a 9.1.1	Coordinate medical treatment with extrication and medical personnel
Res.B4a 9.2	Transfer victims to more definitive medical care
Res.B4a 9.1.2	Medically stabilize trapped victims according to Task Force Operations Manual and Medical Protocols
Res.B4a 9.1.2.1	Ensure victims are medically stabilized according to Task Force Operations Manual and Medical Protocols throughout packaging and extrication
Res.B4a 9.3	Maintain accountability of medical personnel, equipment, and supplies

Activity: *Demobilize/Redeploy*

Definition: Upon completion of assigned mission, disengage from incident site, and debrief personnel

Critical Tasks

Res.B4a 10.2.1	Repackage equipment cache
Res.B4a 10.2	Demobilize base of operations
Res.B4a 10.1.1	Arrange transportation for personnel and equipment
Res.B4a 10.1.2	Debrief SAR capability personnel

Course Scope (continued)

Universal Task List

The Universal Task List⁴ (UTL) is a useful planning reference: a comprehensive menu of tasks that may be performed in major events illustrated by the National Planning Scenarios¹. The UTL describes “what” tasks need to be performed. Federal, state, local and tribal entities reserve the flexibility to determine “who” needs to perform them and “how” to perform them. While no single jurisdiction or agency is expected to be able to perform all the tasks, it is expected that tasks will be chosen based on specific roles, missions, and functions. The UTL should be used by entities at all levels of government as a reference to help them plan, organize, equip, train, exercise, and evaluate personnel from the critical tasks that they may need to perform in major events that could occur across town or across the Nation. The UTL is considered a “living” document that will continue to be refined over time. The applicable tables of the UTL (pages 82 thru 83 of the Version 2.1 issued May 23, 2005) that deal with Search and Rescue are included below. **Jurisdictions with personnel that have completed the Structural Collapse Technician 2 course will have the capacity to perform the following tasks outlined in red:**

Function ID	Sequence Number	Task
Res.B.4	1	Develop plans, procedures, and protocols to prepare for urban search and rescue operations
Res.B.4	1.1	Develop policies and procedures for urban search and rescue
Res.B.4	1.2	Establish, maintain, and manage the national urban search and rescue response system
Res.B.4	1.3	Ensure appropriate legal issues pertaining to liability claims, including the application of the good Samaritan laws, are understood and resolved
Res.B.4	1.4	Establish plans, procedures and protocols for logistical support for urban search and rescue assets
Res.B.4	2	Develop and conduct exercises and training for search and rescue
Res.B.4	2.1	Develop urban search and rescue training programs
Res.B.4	2.2	Provide training for urban search and rescue augmenting organizations
Res.B.4	3	Coordinate urban search and rescue response
Res.B.4	3.1	Provide resource & technical support
Res.B.4	3.1.1	Manage urban search and rescue mutual aid agreements
Res.B.4	3.1.2	Provide technical assistance, training, and operational support to urban search and rescue teams and assets
Res.B.4	3.1.2.1	Provide portable shelters for use by urban search and rescue task force
Res.B.4	3.1.2.2	Provide mobile feeding units for urban search and rescue task force
Res.B.4	3.1.3	Identify need for additional assistance
Res.B.4	4	Conduct Search and Rescue
Res.B.4	4.1	Assess situation and needs
Res.B.4	4.2	Assess incident site to determine search and rescue course of action
Res.B.4	4.2.1	Collect assessment information from damage assessment teams for inclusion in situation reports and for decision-making regarding US&R resources
Res.B.4	4.2.2	Issue additional advisories and alert and activation orders as required
Res.B.4	4.2.3	Determine need for deployment of additional US&R assets
Res.B.4	4.3	Conduct urban search and rescue operations
Res.B.4	4.3.1	Activate urban search and rescue support (US&R)
Res.B.4	4.3.1.1	Activate the national urban search and rescue response system for any incident of national significance

Course Scope (continued)

Universal Task List (continued)

Function ID	Sequence Number	Task
Res.B.4	4.3.2	Deploy urban search and rescue task forces or teams
Res.B.4	4.3.3	Evaluate the disaster site for hazardous materials
Res.B.4	4.3.3.1	Identify heavy machinery support requirements
Res.B.4	4.3.4	Direct search and rescue teams and collapse-site teams
Res.B.4	4.3.5	Search and extract victims from site
Res.B.4	4.3.5.1	Direct the use of heavy machinery in recovery effort
Res.B.4	4.3.5.2	Stabilize and support entry and exit points for urban search and rescue operations
Res.B.4	4.3.6	Provide status reports on urban search and rescue operations
Res.B.4	4.3.6.1	Provide timely situational awareness and response information and establish and maintain chronological log of events in the field
Res.B.4	4.3.7	Formulate redeployment plans for urban search and rescue assets and personnel
Res.B.4	4.3.7.1	Formulate decisions on the demobilization of regional and State first responder assets and personnel
Res.B.4	4.3.8	Provide care for rescuers, including the K-9 first responders

Course Scope (continued)

Additional Courses

TEEX US&R can provide additional courses related to search and rescue at Disaster City® or on-site at your jurisdiction:

US&R Rescue Program:

1. [Structural Collapse - Awareness](#)
2. [Collapse Rescue Operations](#)
3. [Structural Collapse Technician 2](#)
4. [Advanced Structural Collapse 3](#)
5. [Advanced Structural Collapse 4](#)
6. [Medical Considerations for the Rescue Technician](#)
7. [Rescue in a Contaminated Environment \(RICE\)](#)

US&R Search Program:

1. [Disaster Technical Search Specialist](#)
2. [Disaster Canine Search Specialist](#)
3. [Disaster Canine Workshop](#)
4. [Wilderness Search and Rescue](#)
5. [Wide Area Search](#) NOTE: offered at no cost to any eligible jurisdiction
6. [Canine Emergency Medical Care](#) NOTE: offered online at no cost to any eligible participant

US&R Hazardous Materials Specialist Program:

1. [WMD – Enhanced US&R Operations](#)
2. [WMD Considerations for US&R Hazardous Materials Specialists](#)

US&R Swiftwater & Flood Rescue Program:

1. [Swiftwater Rescue – Awareness](#)
2. [Swiftwater Rescue – Operations](#)
3. [Swiftwater Rescue – Technician](#)
4. [Swiftwater Rescue – Technician Refresher](#)

US&R Medical Program:

1. [Disaster Medical Specialist](#)
2. [WMD Considerations for the Medical Specialist](#)
3. [Medical Effects of Primary Blast Injuries](#) NOTE: offered online at no cost to any eligible participant
4. [EMS Operations & Planning for WMD](#) NOTE: offered at no cost to any eligible jurisdiction

US&R Command Staff Program:

1. [Search and Rescue Plans Officer](#)
2. [Search and Rescue Safety Officer](#)
3. [Search and Rescue Communications Specialist](#)
4. [Disaster Logistics Specialist](#)
5. [ICS for Structural Collapse Incidents](#)
6. [Developing a State/Regional CBRNE Task Force](#)

International US&R Program:

1. [International Urban Search and Rescue](#)
2. [International Structural Collapse Rescue](#)

US&R Full-Scale Exercise Program

Course Scope (continued)

Resource Requirements

The following items are provided by TEEX for the delivery of this course:

- Classroom capable of handling all course participants
- Computer loaded with Microsoft PowerPoint®
- Computer Projector and screen
- Flip chart and/or whiteboard or chalkboard
- Flip chart markers and/or whiteboard markers or chalk
- Student Manuals 1, 2 and 3 (one copy each per student)
- [Shoring Operations Guide](#) (one per student)
 - Army Corps of Engineers – 1st Edition, 2nd Printing – March 2008
- [Structural Specialist - Field Operations Guide](#) (one per student)
 - Army Corps of Engineers – 5th Edition, 2nd Printing – March 2008
- Instructor Manuals
- Module 1 – 5 Microsoft PowerPoint® presentation slides
- All tools, equipment, and supplies required to complete field exercises
- All lumber required to complete field exercises

Module Summary

Module #	Module Title	Time Allocation
Day One		
Module 1a	Administration & Introduction	30 minutes
Module 1b	Safety and Security	1 hour
Module 1c	Structural Engineering Systems Part 1 – Building Materials & Structural Systems	1.5 hours
Module 1c	Structural Engineering Systems Part 2 – Collapse Patterns	1 hour
Module 1c	Structural Engineering Systems Part 3 – Hazard Identification & Building Monitoring	1 hour
Admin 0.1	Lunch	1 hour
Module 1c	Structural Engineering Systems Part 4 – US&R Strategy & Structure Sizeup	1 hour
Module 1d	Tool Lab & Rope Rescue Review	4 hours

Module Summary (continued)

Module #	Module Title	Time Allocation
Day Two	Rotation One – Day One	
Module 2a	Shoring Basics	1.5 hours
Module 2b	US&R Shoring Construction	1.5 hours
Skills Stations	Shoring Construction in Technical Skills Training Area	2 hours
Admin 0.2	Lunch	1 hour
Skills Stations	Shoring Construction in Technical Skills Training Area	5 hours
Day Three	Rotation One – Day Two	
Skill Stations	Shoring Construction in Technical Skills Training Area	5 hours
Admin 0.3	Lunch	1 hour
Skill Stations	Shoring Construction in Technical Skills Training Area	5 hours
Day Four	Rotation Two – Day One	
Module 3	Breaching, Breaking, Cutting, and Burning	2 hours
Skills Stations	Breaching, Breaking, Cutting, and Burning in TSTA	3 hours
Admin 0.4	Lunch	1 hour
Skill Stations	Breaching, Breaking, Cutting, and Burning in TSTA	5 hours
Day Five	Rotation Two – Day Two	
Skill Stations	Breaching, Breaking, Cutting, and Burning in TSTA	5 hours
Admin 0.5	Lunch	1 hour
Skill Stations	Breaching, Breaking, Cutting, and Burning in TSTA	5 hours
Day Six	Rotation Three – Day One	
Module 4	Lifting and Moving	3.5 hours
Skill Stations	Lifting and Moving in Technical Skills Training Area	1.5 hours
Admin 0.6	Lunch	1 hour
Skills Station	Lifting and Moving in Technical Skills Training Area	5 hours
Day Seven	Rotation Three – Day Two	
Skill Stations	Lifting and Moving in Technical Skills Training Area	5 hours
Admin 0.7	Lunch	1 hour
Skill Stations	Lifting and Moving in Technical Skills Training Area	5 hours
Day Eight	Final Exercise	
Module 5	Final Exercise in Disaster City®	5 hours
Admin 0.8	Lunch provided by TEEX in Disaster City®	1 hour
Module 5	Final Exercise in Disaster City®	3 hours
Module 5	Written Exam & End of Course Evaluations	2 hour
TOTAL COURSE HOURS		80 hours

Module 1a: Administration & Introduction

Summary: The students will become familiar with the general overview of the course. The instructors will explain the goal of the course, and describe the course outline and structure. Students will also complete all registration and class rosters forms.

Instructional Resources Required:

- Module 1a presentation slides
- Participant Manual
- Computer
- Projector

Terminal Learning Objective: Upon the completion of this module, participants will have received all information regarding course administration and operation requirements for successful completion.

Enabling Objective: Upon the conclusion of this module, participants will be able to:

- 1a-1 Students shall receive an introduction to all Instructors and support staff;
- 1a-2 Students shall receive instructions on starting times and attendance requirements for successful completion of the course;
- 1a-3 Students shall receive information and the necessary paperwork to complete all administrative processes required for successful completion;
- 1a-4 Students shall receive a review of the information they were sent to pre-study prior to arrival at the course;
- 1a-5 Students shall receive an overview of the criteria for successful completion of the course;
- 1a-6 Students shall receive an overview of the Student manual and its contents;
- 1a-7 Students shall be broken into six person squad for operational periods. Multiple squads shall be assigned to a division for rotation periods;
- 1a-8 Students shall have the opportunity to introduce themselves if applicable;
- 1a-9 Students shall receive a schedule of events and rotation times, course agenda and locations of specific events.

Duration: 30 minutes

Method of Instruction: Facilitated seminar format in a classroom environment

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 1b: Safety & Security

Summary: This module discusses proper safety procedures at a structural collapse incident. This course focuses on extended operations during complex urban search and rescue incidents, such as a multistory concrete building collapse that entombs large numbers of victims. Regardless of the collapse scenario encountered, first responders must be familiar with a variety of safety hazards and associated issues. Effective rescue operations at a structural collapse will only be possible if rescuers are fully aware of the hazards involved and the methods necessary to mitigate those hazards. In order for rescuers to perform at an optimum level of safety they will be able to describe:

Instructional Resources Required:

- Module 1b presentation slides
- Participant Manual
- Computer
- Projector

Terminal Learning Objective: Upon the successful completion of this module, participants will understand the importance of including sound safety practices in all phases of the planning and rescue operations.

Enabling Objective: Upon conclusion of the module, participants will be able to:

- 1b-1 Understand the importance of safety during all phases of a mission;
- 1b-2 Understand the importance of recognizing and mitigating safety hazards;
- 1b-3 Understand the importance of incorporating safety into rescue planning and briefing;
- 1b-4 Adopt and employ the concept of “LCES: (Lookouts, Communications, Escape routes, and Safe zones);
- 1b-5 Be able to perform a risk hazard analysis for a specific event and suggest actions to minimize risks and/or eliminate hazards;
- 1b-6 Understand issues related to personal safety and team security zones, as a planning tool;
- 1b-7 Understand the importance of safety risk and hazard identification.

Duration: 1 hour

Method of Instruction: Facilitated seminar format in a classroom environment

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 1c: Structural Engineering Systems Part 1 – Building Materials & Structural Systems

Summary: This module discusses the basic building materials that rescue specialists will encounter during a structural collapse incident and the behavior of those materials under forces not normally applied to these materials. Additionally, this module discusses the ductile and brittle behavior of building materials and the vertical and lateral load resisting systems of buildings.

Instructional Resources Required:

- Module 1c Part 1 presentation slides
- Participant Manual
- Computer
- Projector

Terminal Learning Objective: Upon the successful completion of this module, participants shall understand the essential material and components of structures, and how they behave when subjected to normal and extreme loading.

Enabling Objective: Upon the conclusion of this module, participants will be able to:

- 1c-1 Understand the tension, compression, fending, and shear forces that are exerted on building materials, and how they behave;
- 1c-2 Understand the concepts of ductile and brittle behavior;
- 1c-3 Introduce the concept of Vertical Load Path and Vertical Load Resisting Systems;
- 1c-4 Discuss Lateral Load Resisting Systems, including Box, Moment Frame, and Diagonally Braced Frame Systems;
- 1c-5 Define and discuss structural redundancy.

Duration: 1.5 hours

Method of Instruction: Facilitated seminar format in a classroom environment

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 1c: Structural Engineering Systems Part 2 – Collapse Patterns

Summary: This module provides students with the opportunity to identify and understand the classification of buildings, and the types of collapse patterns specific to the different classifications.

Instructional Resources Required:

- Module 1c Part 2 presentation slides
- Participant Manual
- Computer
- Projector

Terminal Learning Objective: Upon the successful completion of this module, participants shall understand how building structures can be separated into specific types that exhibit unique collapse patterns when subjected to extreme forces due to earthquakes, wind, and explosions and be able to recognize their unique collapse patterns.

Enabling Objective: At the conclusion of this module, the participants will be able to:

- 1c-6 Understand the extreme environment and man caused forces that effect structures;
- 1c-7 Define and understand how buildings are classified by engineers based on their construction materials and lateral load resisting systems;
- 1c-8 Discuss the most common collapse patterns that have been observed as a result of earthquake, winds, and explosions.

Duration: 1 hour

Method of Instruction: Facilitated seminar format in a classroom environment

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 1c: Structural Engineering Systems Part 3 – Hazard Identification & Building Monitoring

Summary: This module discusses the appropriate hazard identification marking system, the specific markings to place on the outside or inside of collapsed structures and the need to constantly monitor the buildings structural integrity during rescue operations to ensure the safety of continuing rescue operations.

Instructional Resources Required:

- Module 1c Part 3 presentation slides
- Participant Manual
- Computer
- Projector

Terminal Learning Objective: Upon the completion of this module, participants will understand the most common signs of distress exhibited by damaged structures and the most common hazards found in damaged structures, and methods that have been used to mitigate them.

Enabling Objective: At the conclusion of this module, the participants will be able to:

- 1c-9 Understand the importance of the various types of cracks in concrete and masonry structures;
- 1c-10 Understand the common hazardous conditions that occur in light frame, heavy wall, and heavy floor and precast buildings.
- 1c-11 Discuss the common methods and equipment used to mitigate structure hazards.

Duration: 1 hour

Method of Instruction: Facilitated seminar format in a classroom environment

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 1c: Structural Engineering Systems Part 4 - US&R Strategy & Structural Sizeup

Summary: This module discusses the initial components of a large disaster including a structural collapse incident and the appropriate strategies that are required for a safe, effective and efficient response. The module discusses a method of rating structures to determine which have the highest probability of viable rescues and potential survivability.

Instructional Resources Required:

- Module 1c Part 4 presentation slides
- Participant Manual
- Computer
- Projector

Terminal Learning Objective: Upon the completion of this module, participants will understand the phases of a large disaster and how the US&R Task Force most commonly is deployed to perform its initial tasks and the most appropriate strategies to be used to effect rescues in various types of structures.

Enabling Objective: At the conclusion of this module, the participants will be able to:

- 1c-12 Understand what normally occurs during the initial phases of Task Force Deployment;
 - Structure Triage
 - Building I.D. and Marking Systems
- 1c-13 Understand the basic strategies that should be employed to produce the best results for most structures;
- 1c-14 Discuss strategies that should produce best results of specific types of buildings;
 - Search
 - Hazard Reduction
 - Victim access including the cutting of concrete
- 1c-15 Learn from the presentation of examples from previous incidents.

Duration: 1 hour

Method of Instruction: Facilitated seminar format in a classroom environment

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 1d: Tool Lab

Summary: This module provides the participants the opportunity to familiarize themselves with the safe operation, inspection, and maintenance of various tools utilized during a structural collapse response.

Instructional Resources Required:

- Module 1d presentation slides
- Participant Manual
- Computer
- Projector
- Tools, equipment, and supplies required to complete field exercises
- Lumber required to complete field exercises

Terminal Learning Objective: Upon the completion of this module, participants shall demonstrate proficiency in the inspection, operation, maintenance of and the safe use of all power tools.

Enabling Objective: At the conclusion of this module, the participants will be able to:

- 1d-1 Understand the operator's influence on tool performance;
- 1d-2 Understand electrical power sources, the electrical loads, and tool safety;
- 1d-3 Understand the tool assessment criteria;
- 1d-4 Be able to perform a pre-use inspection of all gas and electrical power tools;
- 1d-5 Be able to demonstrate the proper procedure in mounting and/or changing the cutting/breaking device to the tool;
- 1d-6 Be able to demonstrate the procedure for the field maintenance of all power tools;
- 1d-7 Be able to demonstrate the proper operation of all power tools.

Duration: 4 hours

Method of Instruction: Facilitated seminar format in a classroom environment and hands-on skill station tool lab rotations in the Technical Skills Training Area (TSTA).

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 2a: Shoring Basics

Summary: This module provides the participants the opportunity to familiarize themselves with the basics of shoring operations, including the design and purpose of various types of shoring.

Instructional Resources Required:

- Module 2a presentation slides
- Participant Manual
- Computer
- Projector

Terminal Learning Objective: Upon the completion of this module, participants shall understand the function and capacity of the various types of shoring used in US&R to support damaged and collapsed structures and why these shores are constructed in their specific configurations.

Enabling Objective: At the conclusion of this module, the participants will be able to:

- 2a-1 Understand the types and amount of load that needs to be supported in emergency shoring;
- 2a-2 Understand what needs to be considered when selecting shoring to support damaged structures.

Duration: 1.5 hours

Method of Instruction: Facilitated seminar format in a classroom environment and hands-on skill station tool lab rotations in the Technical Skills Training Area (TSTA).

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 2b: US&R Shoring Construction

Summary: This module provides the participants the opportunity to construct various wooden and pneumatic shoring systems utilized during a structural collapse response to ensure the safety of the responder and the patient.

Instructional Resources Required:

- Module 2b presentation slides
- Participant Manual
- Computer
- Projector
- Tools, equipment, and supplies required to complete field exercises
- Lumber required to complete field exercises

Terminal Learning Objective: Upon the completion of this module, participants will learn how to maintain the integrity of all structurally unstable elements and how to properly transmit or redirect the collapse loads to stable ground or other suitable structural elements capable of handling additional loads.

Enabling Objective: At the conclusion of this module, the participants will be able to:

- 2b-1 Have a basic understanding of how to conduct a proper shoring size-up;
- 2b-2 Be able to identify locations for proper shoring placement;
- 2b-3 Understand the shoring team concept and identify positions and purpose;
- 2b-4 Understand the different types of shoring components and equipment.

Duration: 18.5 hours

Method of Instruction: Facilitated seminar format in a classroom environment and hands-on skill station tool lab rotations in the Technical Skills Training Area (TSTA).

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 3: Breaching, Breaking, Cutting, Burning

Summary: This module provides the participants the opportunity to familiarize and operate the various essential tools and equipment utilized when breaching, breaking, cutting, and burning through rubble and building material during a structural collapse response to gain access to a patient or provide room for the construction of shoring systems.

Instructional Resources Required:

- Module 3 presentation slides
- Participant Manual
- Computer
- Projector
- Tools, equipment, and supplies required to complete field exercises
- Lumber required to complete field exercises

Terminal Learning Objective: Upon the completion of this module, participants shall properly breach, break, cut and burn to gain access through concrete, steel or other structural components during rescue operations in heavy floor, heavy wall, steel and concrete structures.

Enabling Objective: At the conclusion of this module, the participants will be able to:

- 3-1 Correctly identify types of concrete and their components;
- 3-2 Identify concrete components and their importance to systems design;
- 3-3 Understand their importance during collapse rescue operations;
- 3-4 Identify concrete construction types;
- 3-5 Understand the properties, strength and weaknesses of concrete and its components;
- 3-6 Correctly select tools or tool packages for rescue operations;
- 3-7 Identify functional parts of an exothermic torch;
- 3-8 Identify functional parts of an oxy-acetylene or map gas torch;
- 3-9 Identify components of gasoline (Petrogen) torch;
- 3-10 Effectively trouble shoot each tool as needed.

Duration: 20 hours

Method of Instruction: Facilitated seminar format in a classroom environment and hands-on skill station tool lab rotations in the Technical Skills Training Area (TSTA).

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 4: Lifting and Moving

Summary: This module provides the participants the opportunity to familiarize and operate the various tools, equipment and techniques utilized for lifting and moving rubble and building material during a structural collapse response. Participants will learn how to utilize the tools and equipment to lift and move rubble so they may perform a rescue, place shoring, or further breach the structure to gain access to a patient.

Instructional Resources Required:

- Module 4 presentation slides
- Participant Manual
- Computer
- Projector
- Tools, equipment, and supplies required to complete field exercises
- Lumber required to complete field exercises

Terminal Learning Objective: Upon the completion of this module, participants will understand the relationship of gravity and movement as they apply to urban search and rescue operations.

Enabling Objective: At the conclusion of this module, the participants will be able to:

- 4-1 Understand the basic physics as they relate to mass, gravity, and center of gravity;
- 4-2 Understand Moment of Force considerations as they relate to the movement of stationary objects;
- 4-3 Explain the concepts of Energy, Work, and Power;
- 4-4 Describe what determines the efficiency of mechanical advantage;
- 4-5 Explain the three classes of levers;
- 4-6 Describe the efficiency of inclined planes;
- 4-7 Describe the two types of pulley configurations;
- 4-8 Explain the effective use of high pressure air bags.

Duration: 20 hours

Method of Instruction: Facilitated seminar format in a classroom environment and hands-on skill station tool lab rotations in the Technical Skills Training Area (TSTA).

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Module 5: Field Exercises

Summary: This module requires participants to demonstrate individual and team skills during an evaluation or field exercise. Additionally, the participants must complete a one hundred question written exam. Participants are also provided the opportunity to complete an end of course instructor and facility evaluations.

Instructional Resources Required:

- Module 5 presentation slides
- Participant Manual
- Computer
- Projector
- Tools, equipment, and supplies required to complete field exercises
- Lumber and concrete panels required to complete field exercises

Terminal Learning Objective: Upon the completion of this module, participants will understand the most common signs of distress exhibited by damaged structures and the most common hazards found in damaged structures, and methods that have been used to mitigate those hazards.

Enabling Objective: At the conclusion of this module, the participants will be able to:

- 5-1 Demonstrate proficiency at the safe and effective use of the various tools and equipment available to conduct structural collapse rescue operations;
- 5-2 Demonstrate proficiency at proper selection, placement and construction of shoring systems;
- 5-3 Demonstrate proficiency at the proper selection and use of tools necessary for safe and effective breaching and breaking operations;
- 5-4 Demonstrate proficiency at the proper procedures and techniques for safely and effectively lifting and moving heavy objects;
- 5-5 Demonstrate proficiency at the proper procedures and techniques for rope rescue operations;
- 5-6 Demonstrate proficiency at the proper procedures and techniques for confined space rescue operations;
- 5-7 Apply appropriate safety practices and procedures during Structural Collapse Rescue operations;
- 5-8 Work as a Squad to plan and execute various Strategies and tactics during Structural Collapse Rescue Operations.

Duration: 10 hours

Method of Instruction: Field based US&R structural collapse exercise and hands-on skill demonstrations in Disaster City®.

Instructor Ratio: 1:8

Required Reading: None

Special Instructions: None

Reference Material

This program of instruction references a number of Department of Homeland Security documents which are included below for reference:

1. National Planning Scenarios, Department of Homeland Security
<https://odp.esportals.com>
2. National Preparedness Guidelines, Department of Homeland Security, September 2007
<http://www.fema.gov/pdf/government/npg.pdf>
3. Target Capabilities List (TCL), Department of Homeland Security, September 2007
<http://www.fema.gov/pdf/government/training/tcl.pdf>
4. Universal Task List (UTL), Department of Homeland Security, version 2.1
http://www.ojp.usdoj.gov/odp/docs/UTL2_1.pdf
5. The National Response Framework, Department of Homeland Security
<http://www.fema.gov/emergency/nrf>
6. National Incident Management System (NIMS)
<http://www.fema.gov/nims/index.shtm>
7. Emergency Support Function 9 (ESF-9), National Response Framework
<http://www.fema.gov/pdf/emergency/nrf/nrf-esf-09.pdf>
8. Homeland Security Presidential Directive 5
<http://www.whitehouse.gov/news/releases/2003/02/20030228-9.html>
9. Homeland Security Presidential Directive 8
<http://www.whitehouse.gov/news/releases/2003/12/20031217-6.html>
10. Office of Grants and Training, Department of Homeland Security
<http://www.dhs.gov/>
11. TEEX website
<http://www.teex.org>
12. National Fire Protection Association
<http://www.nfpa.org>