

# University of Illinois Fire Service Institute

## Course Syllabus

**Course Title:** Structural Collapse Rescue Technician

**Course Duration:** 47 hours

**Program:** Special Operations Training Program

**Course Prerequisites:** Structural Collapse Rescue Awareness & Operations

**Required for National Certification (ProBoard):**

Rope Rescue Operations

**Course Description:** The scope of this course is to prepare responders to operate as a local member of a regional team within the NIMS at an emergency incident requiring statewide response that has resulted in the failure of a building constructed of steel, concrete, or masonry. This course is extensively hands-on and prepares the student to operate safely and efficiently at a building collapse. It offers practice in cutting, breaching, lifting, stabilizing, searching, shoring, packaging, and removing victims from a simulated collapse environment. This course is intense and physically demanding, but the competence and confidence that is gained is worth the sweat that is lost.

### Course Requirements:

Pre-Course Work – None

Course Work – Attend and participate in all lectures and practicals

Post-Course Work – None

### Course Policies:

**Safety Policy:** Students shall understand and follow all instructions pertaining to operational safety, as stated by instructors or as written in course materials. Instructors and students shall be mindful of safety at all times. Conduct judged to be unsafe shall be grounds for dismissal from the course.

**Academic Integrity Policy:** IFSI has the responsibility for maintaining academic integrity so as to protect the quality of the education provided through its courses, and to protect those who depend upon our integrity. It is the responsibility of the student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions. Any violation of the code of conduct is grounds for immediate dismissal from the course.

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**American Disabilities Act:** As guaranteed in the Vocational Rehabilitation Act and in the American Disabilities Act, if any student needs special accommodations, they are to notify their instructor and provide documentation as soon as possible so arrangements can be made to provide for the student's needs. If arrangements cannot be made at the class site, the student will test at an alternative time and place where the special accommodations can be made.

## Course Content:

Module: C-1

Title: Force Types

Terminal Learning Objective:

At the conclusion of this module, the student will distinguish the types of forces that are exerted on materials used in building construction.

Module: C-2

Title: Structural Members and Load Systems

Terminal Learning Objective:

At the conclusion of this module, the student will categorize the fundamental concepts of structural members as they are used in building construction.

Module: C-3

Title: Material Properties

Terminal Learning Objective:

At the conclusion of this module, the student will summarize the properties of materials used in building construction.

Module: C-4

Title: Building Types

Terminal Learning Objective:

At the conclusion of this module, the student will relate general characteristics, hazards, principal weaknesses, and properties of the various building types.

Module: C-5

Title: Search and Recon

Terminal Learning Objective:

At the conclusion of this module, the student will identify the components and characteristics of search and reconnaissance.

Module: C-6

Title: Building Assessment

Terminal Learning Objective:

At the conclusion of this module, the student will apply building assessment principles to a collapsed structure.

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Module: C-7

Title: Marking Systems

Terminal Learning Objective:

At the conclusion of this module, the student will use the different marking systems utilized during a structural collapse incident.

Module: C-8

Title: Tools

Terminal Learning Objective:

At the conclusion of this module, the student will explain the proper use of various tools used at a structural collapse incident.

Module: C-9

Title: Concrete

Terminal Learning Objective:

At the conclusion of this module, the student will relate the characteristics of concrete to operations at a structural collapse incident.

Module: C-10

Title: Calculating Weights

Terminal Learning Objective:

At the conclusion of this module, the student will determine the weights of various building materials.

Module: C-11

Title: Rigging and Anchoring

Terminal Learning Objective:

At the conclusion of this module, the student will explain the use of rigging and anchoring at a structural collapse incident.

Module: C-12

Title: Lifting and Moving

Terminal Learning Objective:

At the conclusion of this module, the student will summarize the appropriate techniques used for lifting / moving heavy objects.

Module: C-13

Title: Crane Operations

Terminal Learning Objective:

At the conclusion of this module, the student will coordinate the use of a crane to move various objects to a safe zone.

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Module: P-14

Title: Specialty Tools

Terminal Learning Objective:

At the conclusion of this module, the student will demonstrate the use of various specialty tools that may be utilized during a structural collapse rescue.

Module: P-15

Title: Breaching and Breaking

Terminal Learning Objective:

At the conclusion of this module, the student will demonstrate the proper operation for completing a breach for entry.

Module: P-16

Title: Gas Powered Saws

Terminal Learning Objective:

At the conclusion of this module, the student will demonstrate the proper and safe use of the various gas-powered tools utilized for cutting concrete.

Module: P-17

Title: Anchoring

Terminal Learning Objective:

At the conclusion of this module, the student will demonstrate the use of anchors and hardware that may be utilized during a structural collapse rescue.

Module: P-18

Title: Hydraulic Saws

Terminal Learning Objective:

At the conclusion of this module, the student will demonstrate the proper and safe use of the hydraulic-powered saws utilized for cutting concrete.

Module: P-19

Title: Hydraulic Tools

Terminal Learning Objective:

At the conclusion of this module, the student will demonstrate the proper use of various hydraulic tools that may be used at a structural collapse incident.

Module: P-20

Title: Metal Cutting and Burning

Terminal Learning Objective:

At the conclusion of this module, the student will demonstrate the use of various tools utilized for metal cutting.

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Module: P-21

Title: Rescue Shoring

Terminal Learning Objective:

At the conclusion of this module, the student will utilize various shoring systems to stabilize a collapsed structure.

Module: P-22

Title: Bridge Beam

Terminal Learning Objective:

At the conclusion of this module, the student will lift and stabilize the selected object.

Module: P-23

Title: Crane Operations

Terminal Learning Objective:

At the conclusion of this module, the student will use the proper hand signals directing a crane operator during operations.

Module: P-24

Title: Stitch Cuts

Terminal Learning Objective:

At the conclusion of this module, the student will be able to perform a stitch cut.

Module: P-25

Title: Dirty Breaches

Terminal Learning Objective:

At the conclusion of this module, the student will be able to conduct a dirty breach.

Module: P-26

Title: Lifting and Moving

Terminal Learning Objective:

At the conclusion of this module, the student will lift, stabilize and move a heavy section of concrete.

Module: P-27

Title: Breaking and Breaching in a Confined Space

Terminal Learning Objective:

At the conclusion of this module, the student will create a series of breaches large enough and so configured for entry.

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Module: P-28

Title: Deck of Cards

Terminal Learning Objective:

At the conclusion of this module, the student will be able to estimate, lift, move, stabilize and realign sections of concrete to a predetermined order with each section of concrete intersecting each other.

Module: P-29

Title: Horizontal Lift-Outs

Terminal Learning Objective:

At the conclusion of this module, the student will breach a concrete floor by means of cutting a large square section and lifting out the section to perform a rescue of victims trapped directly below.

## **Reference List:**

Emergency Response to Terrorism Basic Concepts-Student Manual FEMA 2002

FEMA National Urban Search and Rescue Response System: Incident Command System for Structural Collapse Incidents

FEMA National Urban Search and Rescue Response System: National US&R Response System Operational Systems Description US&R Safety Program and Search Procedures

FEMA National Urban Search and Rescue Response System: Rescue Specialist Training Manual, Vol. 1 and 2.

FEMA National Urban Search and Rescue Response System: US&R Safety Program and Search Procedures

Illinois Office of the State Fire Marshal: Structural Collapse Operations  
*Structural Collapse Operations Practical Skills Sheets*

IUOE Local 150, Apprenticeship and Skill Improvement Program: Safe Rigging Procedures for Emergency Responders

National Fire Protection Association Standards 1006 *Standard for Rescue Technician Professional Qualifications*

National Fire Protection Association Standards 1670 *Standard on Operations and Training for Technical Search and Rescue Incidents*

Office for Domestic Preparedness, Emergency Responder Guidelines, 2002.

United States Army Corps of Engineers: *Urban Search and Rescue Structures Specialist Field Operations Guide*

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## Course Schedule

### DAY ONE

**Start Time: 0800**

<b><u>Event</u></b>	<b><u>Duration</u></b>
Module C-1 Force Types	20 minutes
Module C-2 Structural Members and Load Systems	20 minutes
Module C-3 Material Properties	1 hour
Module C-4 Building Types	1 hour
<b>Break</b>	
Module C-5 Search and Recon	1 hour
Module C-6 Building Assessment	20 minutes
Module C-7 Marking Systems	20 minutes
Module C-8 Tools	20 minutes
<b>Lunch</b>	
Module C-9 Concrete	1 hour
Module C-10 Calculating Weights	30 minutes
Module C-11 Rigging and Anchoring	1 hour
<b>Break</b>	
Module C-12 Lifting and Moving	1 hour 20 minutes
Module C-13 Crane Operations	1 hour

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## DAY TWO

**Start Time: 0800**

<u>Event</u>	<u>Duration</u>
Module P-14 Specialty Tools	1 hour
Module P-15 Breaching and Breaking	1 hour
Module P-16 Gas Powered Saws	1 hour
Module P-17 Anchoring	1 hour
<b>Lunch</b>	
Module P-18 Hydraulic Saws	1 hour 30 min
Module P-19 Hydraulic Tools	1 hour 30 min
Module P-20 Metal Cutting and Burning	1 hour 30 min
Module P-21 Rescue Shoring	1 hour 30 min

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## DAY THREE

**Start Time: 0800**

<u>Event</u>	<u>Duration</u>
Module P-22 Bridge Beam	2 hours
Module P-23 Crane Operations	2 hours
<b>Lunch</b>	
Module P-24 Stitch Cuts	1 hour 45 min
Module P-25 Dirty Breaches	1 hour 45 min
Module P-26 Lifting and Moving	3 hours

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## DAY FOUR

**Start Time: 0800**

### Event

### Duration

#### **Exam**

Module P-27 Breaking and Breaching in a Confined Space 4 hours

#### **Lunch**

Module P-28 Deck of Cards 2 hours 30 min

Module P-29 Horizontal Lift-Outs 2 hours 30 min

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## DAY FIVE

**Start Time: 0800**

### Event

### Duration

Final Scenario 8 hours

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