

***NFPA 472-2002
Hazardous Materials Operations
Study Guide***



***National Certification Program
August 2004***

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Introduction to HazMat Operations Certification

Each individual seeking certification within the Kansas Fire & Rescue Training Institute, the University of Kansas, Certification System must submit an application and the appropriate fee to secure entrance into the system. Candidates are given one year in which to complete the certification process. An application form is included in this document and may be used and/or duplicated at the local level. Applications forms may also be downloaded at: <http://www.kuce.org/fst/>

A list of current fees may be obtained by calling 785-864-4790 or 1-866-804-8841 toll free. Purchase orders from cities/organizations will be accepted. Kansas Fire & Rescue Training Institute will not "bill" individuals for the certification fee. Checks or credit cards are accepted from individuals. Upon receipt of the application and fee, the candidate will be scheduled into a specific exam site as requested or the candidate may select an exam site from the schedule on the KUCE website.

Applicants may register for an exam site at the time of application by completing the appropriate block on the application form. Candidates requesting a specific test site should contact the Kansas Fire & Training Institute 785-864-4790 or 1-866-804-8841 to confirm that they have a reserved place at the exam.

After July 1, 2000 **all** HazMat Operations certification candidates must document SCBA face piece fit testing in compliance with 29 CFR 1910.134. Persons with beards or facial hair in the area of the SCBA face piece seal **will not** be allowed to participate in the skills exam for HazMat Operations. **Candidate must be visibly clean shaven without stubble.**

Certification candidates are given two (2) attempts at each component, written and practical. If the candidate takes either component of the exam two (2) times without passing, the candidate is required to resubmit a certification application form as well as an additional certification fee before being scheduled to retest a third time.

Candidates failing the written exam are responsible for notifying Kansas Fire & Rescue Training Institute of their desire to retest and enroll at the next scheduled exam that has available space. Candidates may not take the written exam more than once per day.

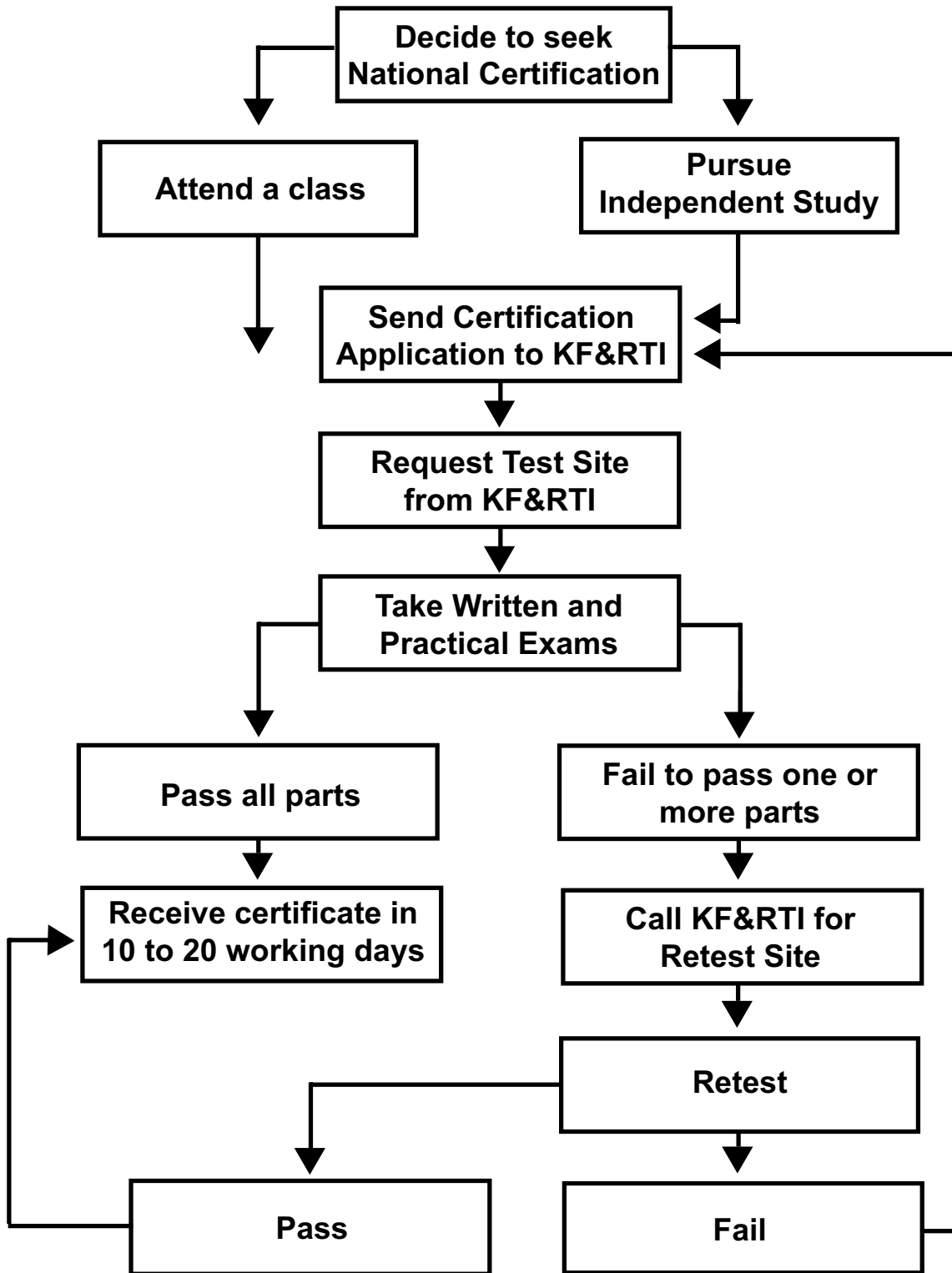
Candidates are responsible for **all of the skills** required by the applicable standard during the practical exam. An exact list of specific skills is included in this study guide. A minimum of four skills per standard will be selected to be tested at each exam site. **Candidates should be prepared to test on any skill outlined in the standard.** The intent of this process is to insure that candidates are prepared to test on all skills required by the NFPA 472-2002 standard.

Practical skill exams are graded on a pass/fail basis. Candidates must successfully complete all skill stations at an exam site to receive a passing grade for the practical exam. Each candidate is allowed two (2) attempts at each station.

Candidates failing the practical exam are responsible for notifying Kansas Fire & Rescue Training Institute of their desire to retest by preregistering for another regularly scheduled exam. Candidates may not take the practical exam more than once per exam day.

**An official picture ID must be shown for admittance to a written or practical exam.
Bring personal protective equipment and an SCBA.**

Certification Flow Chart for HazMat Operations



HazMat Operations

NFPA 472-2002

Prerequisites:

Candidates seeking certification, for **HazMat Operations**, within the Kansas Fire & Rescue Training Institute, the University of Kansas, Certification System must meet the following:

1. Residency and Membership requirements as stated in Section 12, “Certification Policies” of the Criteria and Procedures document published by KU Fire Service Training.
2. Candidate must be competent in all objectives listed in:
 - NFPA 472-2002. Hazardous Materials Awareness Level (Chapter 4)
 - NFPA 472-2002 Hazardous Materials Operations Level (Chapter 5)

Written Examination:

The HazMat Operations written certification exam is based on knowledge objectives listed in *NFPA 472 Standard for Professional Competence of Responders to Hazardous Materials Incidents Operations Level (Chapter 5)*. Candidates will be required to score a minimum of 70%. The written test will consist of 50 questions.

Practical Examination:

The HazMat Operations practical certification exam is based on skill objectives listed in *NFPA 472 Standard for Professional Competence of Responders to Hazardous Materials Incidents Operations Level (Chapter 5)*. Candidates will be required to score a minimum of 100% on critical skills and a minimum of 70% on the remainder of skills.

References/Textbooks:

Essentials of Firefighting, IFSTA, 4th Edition
Hazardous Materials for First Responders, IFSTA, 2nd Edition
Hazardous Materials Managing the Incident, FPP, 1995
Emergency Response to Terrorism—Self Study/Student Manual, FEMA, 1997

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**Kansas Fire & Rescue Training Institute
The University of Kansas
National Certification Application Form**

Return Application to: Kansas Fire & Rescue Training Institute
University of Kansas Continuing Education
1515 St. Andrews Dr.
Lawrence, KS 66047-1625
FAX: 785-864-5074

Personal Information

First Name _____ MI _____ Last Name _____ Date of Birth _____
 Home Address _____ Home City _____ State _____ Home Zip _____
 Home Phone _____ Daytime Phone _____ E-mail Address _____ FAX _____
 Fire Department/Organization _____ Fire Department Address _____

Please circle the category/level of certification for which you are applying. Please contact Kansas Fire & Rescue Training Institute for specific certification fee information (1-866-804-8841).

Levels:

- Fire Fighter I* (includes Haz Mat Awareness)
- Fire Fighter II* (includes Haz Mat Operations)
- Driver/Operator-Aerial
- Driver/Operator-ARFF
- Driver/Operator-Pumper
- Hazmat Awareness
- Hazmat Operations*
- Hazmat Technician*
- Inspector I
- Instructor I
- Instructor II
- Officer I
- Officer II
- Airport Fire Fighter*

***Level requires verification of SCBA Fit Testing. See statement below.**

Payment Method

Each application must be accompanied by payment of appropriate certification fees. Approved methods of payment are listed below. Please indicate method of payment you will use. (Please do not send cash through the mail.)

Payment enclosed (check or money order) Bill my department/organization
 MasterCard VISA Discover American Express
 Account number: _____ Expiration Date: _____

Name as it appears on card: _____

Testing Site Registration (optional)

If you know the location and date of the test site that you wish to attend, please list that information below. A certification exam schedule can be obtained by contacting the Kansas Fire & Rescue Training Institute at 785-864-4790 (phone), 1-866-804-8841 (toll free) or e-mail to kufst@ku.edu or visit our web site ([address: http://www.kuce.org/fst/](http://www.kuce.org/fst/)).

I wish to register for the following test site: Location: _____ Test Date: _____

I verify that I have reviewed the certification guidelines as stated in the Kansas Fire & Rescue Training Institute Certification Criteria and Procedures document and agree to conform to those guidelines. I further verify that all information submitted on this form is accurate.

Applicant's Signature

I verify the person listed on this form has been fit tested as per OSHA 29 CFR Part 1910.134. This form must be signed by the person conducting the fit testing or the Fire Chief.

Signature of Verifying Authority

Special Accommodation: If you will need special accommodation, please check the box preceding this statement and you will be contacted by a staff member.

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Written Exam Study Guidesheets

Standard: NFPA 472, Standard for Fire Fighter Professional Qualifications, 2002 Edition

References: The Reading/Study References listed below represent references from which certification exam questions are taken.

Hazardous Materials for First Responders, IFSTA, 2nd Edition, 2nd printing

Section Subject & NFPA Objective Number	Reading/Study Reference
	<u>Hazardous Materials for First Responders</u> , IFSTA, 2nd Ed.,2nd Printing
Read Glossary	pp. xxii to xxix
Goals/Perform Task 5.1.2	pp. 30–32, pp. 50–55, pp. 77–85, pp. 104–106, pp. 119–120, pp. 137–142, pp. 157–165, pp. 193–197 and pp. 209–210
Surveying the Incident 5.2.1	pp. 40–58, pp. 61–62, pp. 77–94 and pp. 186–197
Collecting Information 5.2.2	pp. 19–28 and pp. 40–92
Material Behavior 5.2.3	pp. 19–32, pp. 70–72, pp. 182–187 and p. 201
Potential Harm 5.2.4	pp. 24–28, pp. 48–51, pp. 93–94, pp. 188–191 and pp. 208–210
Planning Response 5.3.1	pp. 180–188
Defensive Operations 5.3.2	pp. 97–101 and 151–160

Written Exam Study Guidesheets

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Hazardous Materials for First Responders, IFSTA, 2nd Edition, 2nd printing

Section Subject & NFPA Objective Number	Reading/Study Reference
	<u>Hazardous Materials for First Responders</u> , IFSTA, 2nd Ed.,2nd Printing
Decon Procedures 5.3.4	pp. 26–32, pp. 140–145 and pp. 201–210
Scene Control 5.4.1	pp. 137–145 and pp. 201–210
Incident Management 5.4.2	pp. 99–106 and pp. 132–145
Using PPE 5.4.3	pp. 16–19, pp. 109–120 and pp. 144–145
Defensive Actions 5.4.4	pp. 77–83, pp. 97–101, pp. 144–145
Evaluating Progress 5.5.1	pp. 175–197
Communication 5.5.2	pp. 128–131

Written Exam Study Guidesheets

Standard: NFPA 472, Standard for Fire Fighter Professional Qualifications, 2002 Edition

References: The Reading/Study References listed below represent references from which certification exam questions are taken.

Hazardous Materials Managing the Incident, FPP, 2nd Edition, 1995

Section Subject & NFPA Objective Number	Reading/Study Reference
	Hazardous Materials Managing the Incident, FPP, 2nd Edition, 1995
Read Glossary	pp. 501–535
Goal/Perform Task 5.1.2	pp. 349–355 and pp. 362–379
Surveying the Incident 5.2.1	pp. 189–193 and pp. 376–379
Collecting Information 5.2.2	pp. 228–235
Material Behavior 5.2.3	pp. 36–46, pp. 264–270, pp. 362–369 and pp. 435–441
Potential Harm 5.2.4	p. 512
Scene Control 5.4.1	pp. 136–141 and pp. 475–480
Incident Management 5.4.2	pp. 81–98
Defensive Action 5.4.4	p. 441
Evaluating Progress 5.5.1	pp. 386–389
Determining PPE 5.3.3	pp. 299–310

Written Exam Study Guidesheets

Standard: NFPA 472, Standard for Fire Fighter Professional Qualifications, 2002 Edition

References: The Reading/Study References listed below represent references from which certification exam questions are taken.

Emergency Response to Terrorism: Basic Concepts, Student Manual,
U. S. Department of Justice, FEMA

Section Subject & NFPA Objective Number	Reading/Study Reference
Surveying the Incident 5.2.1 Collecting Information 5.2.2 Potential Harm 5.2.4	<u>Emergency Response to Terrorism: Basic Concepts</u> , Student Manual sm. 3-4, sm. 1-8, sm. 3-2 to 5-8, sm. 1-6 to 1-11 sm. 5-6 to 5-9 sm. 2-3 to 2-18

NFPA 472-2002 Hazmat Operations

Performance Test Item 1

Emergency Decontamination

Read: pp. 209–210, *Hazardous Materials for First Responders*, IFSTA, 2nd Edition

Candidate's Name: _____

Percent required to pass: 70% (5 of 7)

Objective: NFPA 472-2002, Chapter 5, 5.3.4

Personal Protective
Equipment Required:

- No special clothing required Full PPE + SCBA Full PPE w/o SCBA
 Helmet, gloves, boots Other:

Tools/Equipment/Setting:

Full PPE and SCBA, 1 1/2" line, brush, victim

Note: This station is operated without water

Read to Candidate
<p>Given a simulated victim that is wearing full PPE and SCBA who has been exposed to a product that requires emergency decontamination. You will be required to remove the victim from the contaminated area and wash the victim down with flooding quantities of water. You must remove the victim's fire helmet (if worn), release the victim's SCBA harness and remove SCBA. The victim may leave his mask on/unit operating). You must remove the victim's fire gear and move the victim to a clean environment. The clean environment will be designated by the evaluator. Your assignment will be completed when you communicate information to ambulance/hospital personnel. The evaluator will serve as ambulance/hospital personnel.</p> <p><input type="checkbox"/> Successful completion of all steps within _____ minutes or <input checked="" type="checkbox"/> within a reasonable time</p>

1st Attempt	2nd Attempt	Skill Checklist	
P	F	P	F
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Evaluator's Signature: _____

Date: _____ _____ P _____ F

Evaluator's comments on reverse side if candidate fails

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Performance Test Item 2

Donning SCBA

Read: pp. 111–112, *Essentials of Fire Fighting*, IFSTA, 4th Edition

Candidate's Name: _____

Percent required to pass: 100% (10 of 10)

Objective: NFPA 472-2002, Chapter 5, 5.4.3

Personal Protective Equipment Required: No special clothing required Full PPE + SCBA Full PPE w/o SCBA
 Helmet, gloves, boots Other:

Tools/Equipment/Setting:

Full PPE, SCBA, stopwatch

Read to Candidate

This skill requires you to don your SCBA within one (1) minute. You must begin with your cylinder turned off and the straps fully extended. Full protective equipment must be donned prior to beginning this skill. You must be wearing your helmet; however, the chin strap may be left loose during the donning process then secured prior to completion of the skill. Gloves may be left off for donning the SCBA but must be on when you complete the skill. Time begins with the evaluator's signal and ends when you clap your hands. Do not adjust equipment or adjust your SCBA after you give the signal to stop your time. Wait for the evaluator to check all equipment.

Successful completion of all steps within 1 minutes or within a reasonable time

1st Attempt		2nd Attempt		Skill Checklist
P	F	P	F	
_____	_____	_____	_____	Demonstrated donning SCBA
_____	_____	_____	_____	1. Places SCBA on back
_____	_____	_____	_____	2. Fastened and tighten all straps
_____	_____	_____	_____	3. Donned and adjusted facepiece
_____	_____	_____	_____	4. Pulled hood over facepiece straps
_____	_____	_____	_____	5. Regulator mounted to facepiece correctly
_____	_____	_____	_____	6. Turned cylinder valve on within one quarter (1/4) turn to fully open
_____	_____	_____	_____	7. Operated unit in positive pressure mode
_____	_____	_____	_____	8. By pass closed
_____	_____	_____	_____	9. Main line valve turned on
_____	_____	_____	_____	10. SCBA donned within 60 seconds or less

Evaluator's Signature: _____

Date: _____ ___P___F
 Evaluator's comments on reverse side if candidate fails

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Performance Test Item 3

Foam Application

Read: pp. 170–172, *Hazardous Materials for First Responders*, IFSTA, 2nd Edition
pp. 498–515, *Essentials of Fire Fighting*, IFSTA, 4th Edition

Candidate's Name: _____

Percent required to pass: 70% (6 of 9)

Objective: NFPA 472-2002, Chapter 5, 5.4.4

Personal Protective Equipment Required: No special clothing required Full PPE + SCBA Full PPE w/o SCBA
 Helmet, gloves, boots Other:

Tools/Equipment/Setting:

Fire department pumper, proportioning equipment and a simulated hazmat fire

Read to Candidate
<p>Given fire fighting foam or vapor suppressing agents, a fire department pumper and foam application equipment and a simulated hazardous materials fire you will operate as a member of a team to demonstrate proper application of foam. The exam coordinator will indicate the type(s) of foam application you will perform from the list below.</p> <p><input type="checkbox"/> Successful completion of all steps within _____ minutes or <input checked="" type="checkbox"/> within a reasonable time</p>

1st Attempt	2nd Attempt	Skill Checklist
-------------	-------------	-----------------

P	F	P	F	
				Application of foam or vapor suppressing agents
				Roll On Method
_____	_____	_____	_____	1. Directed foam stream on ground
_____	_____	_____	_____	2. Foam stream applied near front edge of spill
_____	_____	_____	_____	3. Applied agent until foam spreads across entire surface
				Bank-Down Method
_____	_____	_____	_____	1. Stream applied to an object behind/above spill
_____	_____	_____	_____	2. Foam allowed to run down object onto the surface of the spill
_____	_____	_____	_____	3. Applied agent until foam spreads across entire surface
				Rain-Down Method
_____	_____	_____	_____	1. Stream directed into air above spill
_____	_____	_____	_____	2. Foam allowed to "rain" down onto surface of the spill
_____	_____	_____	_____	3. Applied agent until foam spreads across entire surface

Evaluator's Signature: _____

Date: _____ _____ P _____ F

Evaluator's comments on reverse side if candidate fails

NFPA 472-2002 Hazmat Operations Performance Test Item 4 Defensive Control Procedures

Read: pp. 157–161, *Hazardous Materials for First Responders*, IFSTA, 2nd Edition

Candidate's Name: _____

Percent required to pass: 70% (6 of 8)

Objective: NFPA 472-1997, Chapter 5, 5.4.4

Personal Protective Equipment Required: No special clothing required Full PPE + SCBA Full PPE w/o SCBA
 Helmet, gloves, boots Other:

Tools/Equipment/Setting:

Sand, foam, shovels, absorbent materials (pigs), sand bags, salvage covers, gelling agent, storm drain plugs

Read to Candidate

Given the appropriate tools and equipment and a simulated hazmat leak situation, you will be required to demonstrate/perform defensive control activities. You will be responsible for demonstrating procedures for absorption, damming, diking, dilution, diversion, retention, vapor dispersion and vapor suppression. The exam coordinator will indicate which of the items you will test on from the list below and if full PPE and/or full PPE with SCBA will be necessary for the items chosen.

Successful completion of all steps within _____ minutes **or** within a reasonable time

1st Attempt	2nd Attempt	Skill Checklist
--------------------	--------------------	------------------------

P	F	P	F	
_____	_____	_____	_____	Correctly demonstrate defensive control procedures from the list below
_____	_____	_____	_____	1. Absorption For example: Absorbent pads, saw dust, diatomaceous earth, gelling agent
_____	_____	_____	_____	2. Damming For example: Sand, dirt, salvage cover, absorbent pads, sewer-storm drain plugs
_____	_____	_____	_____	3. Diking For example: Dirt, sand bags, absorbent pads, clay
_____	_____	_____	_____	4. Dilution For example: Applied water stream to dilute substance
_____	_____	_____	_____	5. Diversion For example: Shovels or high pressure water streams, sand bags
_____	_____	_____	_____	6. Retention For example: Salvage cover catch-all basin, earthen dams, floating confinement boom, temporary patches on containers
_____	_____	_____	_____	7. Vapor dispersion For example: Water streams
_____	_____	_____	_____	8. Vapor suppression For example: Vapor suppressing foam

Evaluator's Signature: _____

Date: _____ _____ P _____ F
 Evaluator's comments on reverse side if candidate fails