



Pennsylvania State Fire Academy

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Minimum Standard for Accreditation (MSA)

Date: March, 1999

Last Revised:

Course Title: *Pennsylvania Essentials / Basic Rescue Practices Bridge Course*

SFA Course Code: DHBB

Course length: 40 hours

Lecture/lab: 24/16

Prerequisite: State Fire Academy *Essentials Module I* **OR** certification as a Fire Fighter I or II by a NBFSPQ or IFSAC - accredited entity.

References: Pennsylvania Department of Health *Basic Rescue Practices* instructor guide (1984 edition); other references as listed in lesson plans for both courses.

Course goal: This course is designed to allow persons who have successfully completed *Essentials of Fire Fighting* (or demonstrated their competency by certifying as a Fire Fighter I or II) to acquire the additional knowledges and skills required to certify as a Basic Rescue Technician under the Department of Health Rescue program.

Course description: Many of the knowledges and skills contained in the original *Basic Rescue Practices* are covered in *Essentials Module I*, a competency-based entry-level fire fighter training program. The same core competencies are demonstrated by anyone certifying as a Fire Fighter I or II under NFPA # 1001. This course provides training in the additional competencies, particularly in the areas of rope, technical rescue, and problem-solving needed to 'bridge the gap' between these two courses. This allows *Essentials* graduates and certified fire fighters to become Basic Rescue Technicians without repeating training that they have already had.

Course methodology: lecture, demonstration, and supervised practice.

Competency evaluation mechanism: Cognitive competencies will be evaluated by a written examination at the conclusion of the course. Motor skill competency evaluation will be by the lead instructor as per current DOH policy for *Basic Rescue Practices*.

Student equipment/supply needs: Identical to those for *Basic Rescue Practices*.

Equipment/audiovisual/facilities needs: Identical to those for *Basic Rescue Practices*

Other needs: Course administration procedures are identical to those for *Basic Rescue Practices* re: minimum/maximum enrollments, instructor criteria, student/instructor ratios, etc. Due to the need for multiple stations and remedial training, the 5:1 student/instructor ratio during all lab activity will be based on the total enrollment.

TOPICAL OUTLINE

Lesson number/topic	E.T/T.T.	LEC./LAB.
1. Welcome & Registration; Course Overview; Basic Skills Review	8.0/8.0	1.0/7.0
2. Rescue Review	4.0/12.0	4.0 / 0
3. Rope & Rigging Associated Equipment & Techniques	20.0/32.0	4.0/16.0
3. Structural Search & Rescue; Patient Handling	4.0/36.0	0/4.0
4. Problem Solving	4.0/40.0	0/4.0

Note: These are student contact hours. Set-up, tear-down, meals, breaks, and written test administration times are not included.

OBJECTIVES:

Lesson 1: Welcome and Registration; Basic Skills Review: Upon completion of this lesson, the student will:

- 1.1 Correctly register per DOH and local procedures.
- 1.2 Correctly identify course flow and content.
- 1.3 Demonstrate proficiency (defined as safely, swiftly, and with competence) in the use of self-contained breathing apparatus (SCBA)
 - 1.3a Given an SCBA, demonstrate a pre-use readiness inspection per the manufacturer's specifications.
 - 1.3b Given an SCBA and fire service personal protective equipment (PPE), correctly don the SCBA, perform all safety checks, adjust PPE, and be ready to enter a hazardous atmosphere within 70 seconds of the signal to begin.
 - 1.3c Demonstrate the doffing of SCBA after use, and the restoration of same to service, to include cleaning and cylinder refilling.
 - 1.3d Given an SCBA, fire service personal protective equipment (PPE), and hand tools, demonstrate the ability to negotiate an SCBA training 'maze' of light to moderate complexity under conditions of obstructed visibility.
- 1.4 Given his/her practice rope, demonstrate proficiency in tying the following knots and hitches: a) half hitch; b) becket bend; c) clove hitch, both free and around an object; d) figure 8 on a bight; e) overhand safety knot; and f) bowline, free and around an object
- 1.5 Demonstrate the ability to raise and climb basic fire service ground ladders.
 - 1.5a Given a 14' roof or wall ladder, PPE, and a scenario, carry the ladder from the vehicle or ground; raise the ladder, making it safe for climbing; lower the ladder and return to the starting point using a one -person carry and raise.

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- 1.5b Given a 24' extension ladder, PPE, and a scenario, carry the ladder from the vehicle or ground; raise the ladder, making it safe for climbing; lower the ladder and return to the starting point using a two-person carry and raise.
- 1.5c Given a positioned 24' extension ladder, PPE, and a fire service hand tool, climb and descend the full length of the ladder, locking in with a leg lock or safety harness at mid-point.
- 1.6 Demonstrate the ability to operate portable fire extinguishers.
 - 1.6a Extinguish a class A fire, given a 2 ½ gallon pressurized water extinguisher and a fire involving 20-30 lbs. of Class A fuel.
 - 1.6b. Extinguish a class B fire, given a BC-rated dry chemical extinguisher of at least 10lbs. capacity and a combustible liquid pan fire of at least 16 square feet surface area.

Lesson 2: Rescue Review: Upon completion of this lesson, the student will:

- 2.1 Given a rescue scenario,
 - 2.1a Identify safe/unsafe practices and conditions appropriate to the scenario in question.
 - 2.1b Identify appropriate personal protective equipment (PPE) to the scenario in question.
 - 2.1c Identify relevant patient care/medical considerations for the patient(s) involved in the scenario.
 - 2.1c Identify and plan a systematic approach to effecting the rescue.
- 2.2 Identify the potential respiratory hazards associated with rescue and the capabilities/limitations of self-contained breathing apparatus (SCBA) in the rescue environment.
 - 2.2a Name at least 3 examples of irrespirable/potentially irrespirable atmospheres commonly encountered in rescue scenarios
 - 2.2b Compare and contrast the capabilities of the following types of SCBA from a rescue perspective: open circuit SCBA, closed circuit SCBA, dual-purpose SCBA, and air-line unit SCBA.
- 2.3 Given a rescue scenario and a selection of rescue equipment, identify appropriate equipment and describe its uses and limitations.
 - 2.3a Identify and describe the safe operation of the hand and power tools contained in the minimum list for Level I and II rescue units per the DOH *Voluntary Rescue Service Recognition* program.
 - 2.3b Select tools appropriate to safely and effectively accomplish the rescue in question.

Lesson 3: Rope and Rigging; Associated Equipment & Techniques: Upon completion of this lesson, the student will:

- 3.1 be able to recall basic facts and terminology associated with rescue service rope
 - 3.1a The student will be able to list seven (7) common uses of rope in the rescue service.

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- 3.1b. The student will be able to list the two (2) major families of materials used in rope construction.
- 3.1c. The student will be able to define “Hawser Lay” rope and describe how the rope is assembled.
- 3.2. be able to identify the chief disadvantages of manila as a rescue rope construction material
 - 3.2a. The student will be able to identify the critical time period in the life expectancy of manila fiber rope.
 - 3.2b. The student will be able to describe percentage loss of working strength of manila rope on a yearly basis.
 - 3.2c. The student will be able to describe strength characteristics of manila rope.
 - 3.2d. The student will be able to describe the effects of manila rope exposure to age, heat, water, sunlight, corrosives, petroleum products and dirt.
- 3.3. demonstrate a familiarity with the characteristics of various common rope materials
 - 3.3a. The student will be able to list the critical temperature for manila, nylon, Dacron and polyolefin fiber ropes.
 - 3.3b. The student will be able to describe the comparative strengths of manila, dacron, and nylon fiber ropes of equal size.
 - 3.3c. The student will be able to relate the chief characteristic of nylon fiber rope.
 - 3.3d. The student will be able to relate the chief characteristic of dacron fiber rope.
 - 3.3e. The student will be able to relate the chief characteristic of polyolefin fiber rope.
 - 3.3f. The student will be able to compare and contrast the dynamic characteristics of manila and nylon fiber rope.
- 3.4. be able to demonstrate knowledge of rope construction and its effect on the suitability of rope for rescue service.
 - 3.4a. The student will be able to list the three (3) basic styles of rope construction.
 - 3.4b. The student will be able to identify rope of laid construction, kernmantle construction and braided construction.
 - 3.4c. The student will be able to list three (3) unfavorable characteristics of laid construction rope.
 - 3.4d. The student will be able to define the work kernmantle.
 - 3.4e. The student will be able to relate the primary function of the braided outer sheath of kernmantle construction rope.
 - 3.4f. The student will be able to relate the primary function of the inner core of fibers of kernmantle construction rope.
 - 3.4g. The student will be able to relate the percentage of the working strength of kernmantle construction rope of both the outer sheath and the central core of fibers.

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- 3.4h. The student will be able to list three (3) favorable handling characteristics of kernmantle construction rope.
- 3.4i. The student will be able to define static kernmantle rope and dynamic kernmantle rope.
- 3.4j. The student will be able to describe the prime characteristic of braided construction rope.
- 3.4k. The student will be able to list what percentage of fibers of the rope are exposed to abrasion for laid construction, kernmantle construction and braided construction ropes.
- 3.5 given a rescue scenario, be able to choose the proper type, material, and size rope for the particular rescue application in question.
 - 3.5a The student will be able to name the material and style of construction best suited to ropes used as lifelines in the rescue service.
 - 3.5b. The student will be able to list the five (5) contributing factors which must be considered in selection rope for rescue service.
 - 3.5c. The student will be able to identify the minimum weight that a lifeline should be expected to support.
 - 3.5d. The student will be able to relate the minimum safety factor ratio of ropes used as lifelines.
 - 3.5e The student will be able to identify the appropriate applications of static lines and dynamic lines in the rescue service.
- 3.6 be able to define the following terms as they apply to rope in the rescue service:
 - a. Knot
 - b. Hitch
 - c. Standing part of the line
 - d. Running end of the line
 - e. Loop
 - f. Turn
 - g. Roundturn
 - h. Bight
 - I. Haul line
 - j. Safety line
 - k. Belay
 - l. Lifeline
 - m. Utility line
 - n. Static rope
 - o. Dynamic rope
 - p. Laid rope
 - q. Kernmantle rope
 - r. Breaking strength
 - s. Rope size
 - t. Elongative
 - u. Hockle
 - v. Life span of rope
- 3.7 be able to list the prime function of each of the following:
 - a. Overhand knot
 - b. Figure-of-eight knot
 - c. Half-hitch
 - d. Square knot
 - e. Sheet bend
 - f. Clove hitch
 - g. Bowline
 - h. Bowline-in-a-bight
 - I. Double bowline
 - j. Chimney hitch
 - k. Grapevine knot
 - l. Figure eight-in-a-bight
 - m. Tracer figure eight
 - n. Water know (tracer overhand knot)
- 3.8 given a length of rope, conduct an inspection of said rope and determine its suitability for future service.

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- 3.8a The student will be able to relate when and how rescue rope is to be inspected.
- 3.8b The student will be able to list six (6) criteria used in making the decision to retire a rescue rope.
- 3.8c The student will be able to list eight (8) common causes of rope damage.
- 3.9 will identify and describe the distinguishing features and uses of various auxiliary rope equipment.
 - 3.9a The student will be able to list four (4) uses of nylon webbing in the rescue service.
 - 3.9b. The student will be able to list two (2) uses of carabiners in the rescue services.
 - 3.9c The student will be able to identify the material (aluminum/steel) that is used in constructing the carabiners used in the rescue training program, and describe the advantages and disadvantages of each from a rescue service perspective.
 - 3.9d The student will be able to differentiate between a locking and non-locking carabiner.
 - 3.9e The student will be able to identify a figure 8 descent device and a rappel rack, and relate their function(s) and use in the rescue service.
 - 3.9f The student will be able to identify an ascent device, and relate its functions and use in the rescue service.

SKILL OBJECTIVES

- 3.10 Given a piece of rope, the student will be able to demonstrate their ability to tie the following knots and hitches:
 - a. Overhand knot
 - b. Figure eight knot
 - c. Half hitch
 - d. Square knot
 - e. Sheet bend
 - f. Clove hitch
 - g. Bowline
 - h. Bowline-on-the-bight
 - I. Double bowline
 - j. Chimney hitch
 - k. Grapevine knot (double fisherman's knot)
 - l. Figure eight-on-the-bight
 - m. Tracer figure eight
 - n. Rescue harness
- 3.11 Given a piece of 1" nylon webbing, the student will be able to demonstrate his ability to tie a water knot.
- 3.12 Given a piece of rope suitable for use as a lifeline and all other necessary equipment, the student will be able to demonstrate his ability to properly secure the rope to an object to permit a personal controlled descent of the rope.

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- 3.13 Given a piece of 1" nylon webbing (minimum 12 feet in length), the student will be able to demonstrate their ability to secure the webbing to their body (i.e. tie a sit harness).
- 3.14 With the student already in a properly tied sit harness and given two carabiners, the student will be able to demonstrate their ability to properly attach the carabiners to the sit harness.
- 3.15 Given a piece of rope suitable for use as a lifeline and a figure 8 descent device, 2 carabiners and a properly tied sit harness, the student will be able to demonstrate their ability to attach the life line to the figure 8 and attach the descent device to the sit harness.
- 3.16 Given a pre-rigged lifeline, sit harness, 2 carabiners and a figure 8, the student will be able to demonstrate their ability to perform a personal vertical controlled descent for a minimum distance of 25 feet.
- 3.17 Given a piece of rope suitable for use as a lifeline and all necessary equipment, the student will be able to demonstrate their ability to rig a safety line (belay line), properly attach it to another rescuer, and operate the safety line during a controlled descent.
- 3.18 Given all necessary equipment, the student will be able to demonstrate their ability to rig and operate a hauling system of 2:1 and 3:1 mechanical advantage.
- 3.19 Given a basket stretcher, blanket, appropriate rope and a patient, the student, with one assistant, will be able to demonstrate their ability to secure the patient in the stretcher using the following:
 - 3.19a Needle and thread lashing
 - 3.19b Criss-cross lashing
- 3.20 Given a "D-ring" stretcher, or a backboard, blanket, appropriate rope, a patient and one assistant, the student will be able to demonstrate their ability to lash the patient to the stretcher or board.
- 3.21 Given a basket stretcher and piece of rope, the student will be able to demonstrate their ability to rig the stretcher for the following:
 - 3.21a Horizontal lower using a bridle bowline
 - 3.21b Vertical drop using a bowline
- 3.22 Given a basket stretcher and appropriate rope, the student will be able to demonstrate their ability to rig a:
 - 3.22a One-point guy line
 - 3.22b 2-Point guy line
- 3.23 Given all necessary equipment, the student will be able to demonstrate their ability to hoist and lower a patient in a basket stretcher while performing as the primary descent device controller and as a guy line controller.
- 3.24 Given two (2) ladders and appropriate rope, the student will be able to demonstrate their ability to rig a ladder A-frame device.

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Lesson 4: Structural Search & Rescue; Patient Handling: Upon completion of this lesson, the student will:

- 4.1 Correctly review the essential safety and procedural concerns surrounding structural search and rescue as presented in *Essentials Module I* and *Basic Rescue Practices*.
 - 4.1a Relate the significance of fire (or other hazardous) situation, structural stability, and status of fire attack (or hazard control) in planning and executing a structural rescue.
 - 4.1b Demonstrate the ability to function within a personnel accountability system while performing structural search and rescue.
- 4.2 Acting as a member of a structural search and rescue team, successfully locate and remove patients to a point of relative safety in a time frame that gives a reasonable assurance of survivability, given a structural search and rescue scenario, a selection of hand tools and support equipment (such as ground ladders and hand lights), and one or more trapped patients.
 - 4.2a Perform an accurate pre-search size-up.
 - 4.2b Select and use a search pattern and technique appropriate to the scenario.
 - 4.2c Demonstrate the proper and appropriate use of hand tools and support equipment in accomplishing the given search and rescue mission.
 - 4.2d Maintain his/her orientation relative to the building layout and points of egress; react appropriately, quickly, and safely to any unforeseen or emergency situation introduced as part of the scenario.
 - 4.2e Effect removal of the patient(s) to a point of relative safety using an appropriate and safe patient handling technique.

Lesson 5 Problem Solving: Upon completion of this lesson, the student will:

- 5.1 Acting as a member of a rescue team, select and use appropriate techniques learned in both this course and the prerequisite to safely and effectively rescue the entrapped patient(s), given at least three significantly different complex rescue scenarios and a selection of rescue equipment as outlined in the course Instructor Guide.
- 5.2 Terminate the rescue evolution by properly checking, cleaning, and storing all tools and equipment used to assure future readiness.

**Questions/Comments: Rita Wessel, Curriculum Specialist: Extension 106
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