

# COURSE STANDARDS AND OVERVIEW

This course is designed to be an introduction to cavern diving and to help the student diver develop the skills, knowledge and techniques necessary for cavern diving.

## Prerequisites

To qualify for the Cavern Diver course, an individual must:

- 1. Be certified as a PADI Advanced Open Water Diver or have a qualifying certification from another training organization.**
- 2. Be 18 years of age or older.**

## Instructor Supervision

Cavern Diver courses may be conducted by a Teaching status PADI Underwater Instructor (or PADI Instructor with a higher rating) who has been certified as a PADI Cavern Diving Instructor.

**The maximum student diver-to-instructor ratio for open water training dives is eight students per instructor (8:1), with 2 students per instructor for penetration cavern-training dives. During penetration cavern-training dives, student divers are to be accompanied by a PADI Cavern Diving Instructor.**

## Considerations for Cavern Training Dives

*Cavern diving* is defined as any dive conducted within the light zone of a cave. *Cave diving* is any dive conducted beyond the light zone of a cave. The *light zone* of a cave is defined as that part of the cave from which natural light illuminating the entrance is visible at all times.

**The Cavern Diver course is to include four training dives, which are to be conducted over at least two days.** The minimum number of recommended hours is 24, with time being equally divided between knowledge development and actual pre-dive preparation and water-training sessions.

**The first dive is to be conducted in open water, practicing the use of lines and reels and emergency procedures. The final three dives are to be conducted in the cavern environment. Penetration training dives are limited to within the light zone and within 40 metres/130 feet from the surface, vertical and horizontal distance included. No out-of-air drills are to be practiced in the overhead environment.**

**After the training dives, student divers are required to log their dives in their personal log books.**

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## COURSE OVERVIEW

This course covers the knowledge and techniques of cavern diving and describes the dangers involved with cave diving. Cavern diving is in no way intended to provide instruction for cave diving.

**To conduct a Cavern Diver course, the following is to be included:**

- 1. The planning, organization procedures, techniques, problems, and hazards of cavern diving**
- 2. Special equipment considerations including, but not limited to: lighting, guidelines, reel handling and redundant breathing**

systems

**3. Proper body position and buoyancy control, air-consumption management and emergency procedures**

**4. Information that describes the specific hazards of cavern diving should include, but not be limited to: silting, line entanglement and breakage, disorientation from permanent lines and emergency situations unique to cavern diving**

## **CERTIFICATION PROCEDURES**

The certifying instructor obtains a Cavern Diver certification by submitting a completed, signed PIC to the appropriate PADI Office. **The instructor who conducts the student's final open water training session is to be the certifying instructor. The instructor certifying the student must insure that all certification requirements have been met.**

## **KEY STANDARDS**

**Prerequisite Certification: PADI Advanced Open Water Diver or qualifying certification**

**Minimum Age: 18**

Recommended Course Hours: 24

**Minimum Open Water Training: 4 dives on 2 days**

**Student-to-Instructor Ratio: 8:1, 2:1 for cavern penetration**

**Minimum Instructor Rating: Cavern Diver Specialty Instructor**

Specialty Course Instructor Outline

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## **Introductory Information**

### **Cavern Diver Specialty Course Instructor Outline**

Heading IV, in the outline "Academic Topics," provides specific information that is to be presented to students prior to the conclusion of the course. At the discretion of the instructor, the topics in this section may be "modularized" (divided into several academic presentation sessions).

Heading V, in the outline "Equipment Modification Workshop," describes a session that is to take place before students participate in any in-water activities.

Heading VI, in the outline "Land Drills," describes several dry-land exercises that are to take place before students participate in the shallow-water line drills (Dive Two) and the subsequent practice dives (Dives Three and Four).

Heading VII, on the outline "In-Water Sessions," describes several exercises for training Dives One-Four. Depending on logistics, Dives One (demonstration dive) and Two (establishing a shallow water line course) may be conducted in reverse order. Dives One and Two, however, are to be conducted prior to student practice dives, Dives Three and Four.

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## **I. Course Overview**

The purpose of the PADI Cavern Diver specialty course is to familiarize divers with the skills, knowledge, planning, organization, procedures, techniques, problems and hazards of cavern diving. The Cavern Diver course is intended to provide a safe, supervised introduction to diving in natural overhead environments. However, although the course introduces students to the myriad skills, procedures and techniques that cavern diving has in common with cave diving, the Cavern

Diver course *is not* intended to provide an introduction nor enticement to cave diving.

Training should emphasize conservation, safety and enjoyment. The goals of PADI Cavern Diver training are:

A. To develop the student's practical knowledge of the cavern environment.

B. To raise the student's awareness of the need for conservation and positive landowner relations.

C. To familiarize the student with the three direct and two major contributing causes of cave and cavern diving fatalities (Accident Analysis) and how they form the basis of the safety rules around which this course and all subsequent cavern dives revolve.

*It is vital that you understand the role that Accident Analysis, and the safety rules derived from it, play as*

*the basis for all Cavern Diver training. Accident Analysis has revealed that virtually every cave and cavern*

*diving fatality has been the direct result of one or more of the following three factors:*

- *Failure to run a continuous guideline to open water.*
- *Failure to keep at least two-thirds of each diver's starting air volume in reserve to exit the cave or cavern.*
- *Diving below 40 metres/130 feet on compressed air. Additionally, the following items have been identified*

*as major contributing factors in the vast majority of cave and cavern diving accidents:*

- *Lack of proper training (or exceeding the limits of training and experience).*
- *Inadequate number of lights.*

*From this analysis has come the following rules:*

1. *Do not cavern dive without the proper training. Stay within the limitations of your training when you cavern dive.*

2. *Always run a continuous guideline that links you and your buddies to a point, in open water, from*

*which you can make a direct, uninterrupted ascent to the surface.*

3. *Always keep a minimum of two-thirds of your starting air supply in reserve. Begin your exit from the*

*cavern as soon as you reach this predetermined limit.*

4. *Do not dive deeper than 40 metres/130 feet using compressed air. The maximum depth limit recommended*

*for this level of training is 21 metres/70 feet.*

5. *Use at least three sources of light. For cavern diving, your primary light source is the sun, backed up by*

*a primary and a secondary battery-powered light.*

*In conducting this course, you will be most effective if you constantly establish the need to know (value) by*

*explaining how the subject matter relates to Accident Analysis.*

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D. To enable the student to plan and organize dives to safely explore caverns that fall within the stated limitations of Cavern Diver training and that offer conditions as good as the caverns in which the student was trained.

## **II. Cavern Diver Course Requirements**

**A. Prerequisite certification: PADI Advanced Open Water or**

have a qualifying certification from another training organization.

**B. Minimum age requirement: 18 years.**

**C. Student-to-instructor ratio: 8:1. 2:1 for cavern penetration. Instructor must accompany students during any penetration. The 2:1 ratio cannot be increased by the use of certified assistants.**

D. Confined water training may be added at the discretion of the instructor conducting the specialty course. As a preassessment before the course begins, a confined water session may include a scuba-skills review. The PADI Skill Evaluation or the Scuba Review program are excellent means of accomplishing this review.

***Be aware that shallow-water line drills are required for this course. These drills are not to be***

***conducted in an overhead environment. Instead, a swimming pool or shallow, open water may be used.***

*While a shallow, open water site provides a more realistic environment for the line drills, there may be*

*circumstances in which such an environment is not available. In these instances, a pool may be substituted.*

*Additionally, the instructor may choose to use a pool for preassessment and development of critical skills*

*such as buoyancy control, body position and specialized, cavern diving propulsion techniques.*

E. Dive data

**1. Four scuba dives, plus shallow-water line drills.**

**2. Penetration-training dives are to be limited to within direct sight of the cavern exit and within 40 metres/130 feet from the surface, vertical and horizontal distance included. Visibility is to exceed 12 metres/40 feet; maximum depth during training dives is 21 metres/70 feet.**

**3. No out-of-air drills are to be introduced in the overhead environment.**

### **III. Student and Instructor Equipment Requirements**

#### **A. Student Equipment**

1. All personal, standard diving equipment including:

a. Mask and fins (see note on next page)

b. Exposure suit appropriate for the local diving environment

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and depth, including: hood, boots and gloves, if needed (see note on next page).

c. Weight system (see note on next page)

d. BCD with low-pressure inflator

e. Regulator with submersible pressure gauge

f. Alternate air source suitable for sharing air with other divers and which is connected directly to the diver's primary air supply (see note on next page).

g. A single diving cylinder with at least 1415 litres/50 cubic feet of air (see note on next page).

h. Complete instrumentation, including depth, time and direction (see note below).

i. Recreational Dive Planner — The Wheel or Table

j. Dive tool or knife capable of cutting guideline quickly and effectively (see note below)

k. Slate with pencil

2. Log book

3. Specialty equipment

a. Reel and guideline — one per team required; one per diver recommended.

- *Snorkels, regulator first-stage dust caps and similar pieces of equipment that stick up, unseen, behind the*

*diver's field of vision constitute a major guideline entanglement hazard in cavern diving.*

*Nevertheless, there*

*may be circumstances in which a snorkel is necessary for safety and air conservation while swimming to*

*and from the cavern site on the surface. In such instances, the snorkel should be removed and clipped to the*

*guideline prior to entering the cavern. A "pocket snorkel" may also be used and should be stored in a BCD*

*or wet suit pocket.*

- *Students should be encouraged not to wear gloves.*

- *Unless required for safety in adjacent open water, the use of standard, quick-release weight belts should be*

*discouraged. (Releasing weights would only serve to pin divers to the ceiling.) Instead, encourage students*

*to attach weights farther up on the body so that overall trim and body position are improved.*

- *Acceptable alternate-air-sources for cavern diving include conventional octopus second stages, integrated*

*alternate air source BCD inflators and the use of Y valves (valve which enable the use of two separate*

*regulator first and second stages with separate on/off valves on a single tank). Self-contained alternate air*

*sources are generally not appropriate for cavern diving in that they lack sufficient capacity to carry two-thirds*

*of a diver's starting air volume as a reserve.*

- *It is strongly recommended that students use single cylinders of equal volume. (Smaller divers need to carry*

*sufficient air to get both themselves and a larger, out-of-air buddy out of the cavern.) **Use of double cylinders***

***is not allowed.** J valves should not be used.*

- *Depth and time monitoring may be accomplished through the use of electronic dive computers, although*

*students should be encouraged to carry additional depth and time monitoring instrumentation as backup in*

*case of computer failure.*

- *Dive knives or cutting tools should be as small as possible. They need only be capable of cutting guideline*

*quickly and effectively; sawing or prying abilities are neither needed nor desired in the cavern environment.*

*Knives should not be worn any where on the leg, as this constitutes a major entanglement hazard.*

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- b. Primary, battery-powered dive light
- c. Secondary (backup), battery-powered dive light

### **B. Instructor equipment**

- 1. All required student equipment, plus:
  - a. Y valve or double-cylinders with dual-valve manifold or separate K valves
  - b. Three battery-powered lights
  - c. Primary reel and personal safety reel

*At the present time, the prevailing standard of practice is for Cavern Diver Specialty Instructors to conduct the course while wearing Full Cave equipment. This, of course, is only recommended if the instructor has Full Cave certification and is a regulation that is enforced at many sites.*

### 2. Safety equipment

- a. First aid supplies and equipment. Recommended: first-aid kit, Pocket Mask and oxygen.
- b. Emergency decompression air cylinder (clipped to line at cavern entrance)

### 3. Materials that may be used to teach this course

- a. General PADI materials and training aids:
  - Giant Recreational Dive Planner — the Wheel and Tables
  - Log Book (Adventure Log recommended.)
  - Student Record File
  - Student Folder
  - Dive Roster
- b. PADI reference materials
  - *The Encyclopedia of Recreational Diving*
- c. PADI recognition materials:
  - PIC envelopes
  - Specialty Diver wall certificates
  - Cavern Diver specialty chevrons

## **IV. Academic Topics**

The following is an actual presentation outline. Directions to, or comments for, the instructor are enclosed in [brackets].

### **A. Introductions, course overview and welcome to the course**

- 1. Staff introductions
  - a. [Introduce yourself and your assistants.]
  - b. [Have students introduce themselves and explain why they're interested in cavern diving — break the ice and encourage a relaxed atmosphere.]

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### 2. Course goals

- a. The goals of the course are:
  - To develop your practical knowledge of the cavern environment.
  - To raise your awareness of the need for conservation and positive landowner relations.

- To familiarize you with the three direct and two major contributing causes of cave and cavern diving fatalities (“Accident Analysis”) and how they form the basis of the safety rules around which this course and all subsequent cavern dives revolve.
  - To enable you to plan and organize dives to safely explore caverns that fall within the stated limitations of Cavern Diver training and that offer conditions as good as the caverns in which you were trained.
- b. The Cavern Diver course, however, is in no way intended to provide instruction for cave diving. [Discussed in depth throughout the course; elaborate at this point only if necessary.]

### 3. Course overview

a. Classroom presentations. [Remind students that academic information may also be given during land drills and pre-dive briefings. If additional classroom sessions are planned, give dates, times and locations.] There will be \_\_\_\_\_ (number) classroom presentations during the course. The classroom (academic) presentations in the Cavern Diver course covers:

- Conservation/landowner relations
- General terminology and geology
- Types of caves and their formations/entrance descriptions
- Silt, chemicals, gases, and related terminology
- Hazards of the environment
- General and special equipment considerations for cavern diving
- Line use
- Anti-silting techniques in cavern diving
- Communications underwater
- Psychological considerations for cavern diving
- Stress factors, sources, and effects in cavern diving
- Cavern diving procedures
- Accident analysis
- Emergency procedures

b. Equipment-modification workshop. This will be conducted prior to the first water session and will enable you to make the minor modifications necessary to adapt your open water diving equipment for cavern diving.

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c. Pool sessions. [Pool sessions are generally not included in the Cavern Diver course. If they are, it is usually to cover a review of basic skills and to help students develop the specialized buoyancy-control, body-position and propulsion techniques used in cavern diving. If the course is to include pool sessions, give date, time and location.]

d. Land drills. [Give date, time and location. Land drills are generally conducted prior to any water work and are to take place before any shallow-water line drills or practice cavern dives; however, if dictated by logistical considerations, they may take place after the demonstration dive.]

Land drills provide the opportunity to:

- Learn and practice basic guideline and reel use, emergency procedures and other cavern diving skills prior to having to practice and apply them in the water.

e. Shallow-water line drills. [Give date, time and location. Shallow-water line drills are generally conducted after the demonstration dive (to take advantage of the reserve air left in students' tanks after the *demo* dive and to maintain a dive profile that moves from deep to shallow); however, they may also take place beforehand.] Shallow-water line drills provide the opportunity:

- For you to practice the skills learned during the land drills before having to apply them in an actual cavern.

f. Demonstration dive. [Give date, time and location; identify how this dive will be sequenced relative to the land drills and shallow-water line work.] The demonstration dive provides the opportunity:

- For the instructor to make certain that you are properly weighted for cavern diving and to recommend or make adjustments in weight.

- For the instructor to further assess your buoyancy control skills and overall abilities, and to make recommendations for further improvement.

- For you to see and practice the specialized propulsion techniques associated with cavern diving.

g. Practice cavern dives. [Give dates, times and locations.] Practice cavern dives provide the opportunity:

- For you to practice and apply the skills learned during classroom sessions, land drills, shallow-water line drills and the demo dive in a realistic environment.

- For the instructor to evaluate how well you can apply what you have learned to date and to make suggestions for further improvement.

- For everyone to enjoy exploring underwater caverns.

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#### 4. Certification

a. Upon successful completion of the course, you will be awarded PADI Cavern Diver Specialty certification.

b. This certification means that you will be able to plan, organize, conduct and log dives in which you safely explore caverns that fall within the stated limitations of cavern diver training and that offer conditions as good as the caverns in which you were trained. The limitations of cavern diver training and certification are:

- No dives outside of daylight hours.

- No dives outside of *direct sight* of the cavern entrance.

- No dives beyond a linear distance of 40 metres/130 feet from the surface (depth to the entrance plus penetration distance).

- No dives requiring planned stage decompression.

- No dives that require divers to pass through *restrictions* (places too narrow to allow divers to pass through side-by-side or piggyback).
  - Dives below a depth of 21 metres/70 feet are not recommended.
- c. You may apply for the rating of Master Scuba Diver if you are a PADI Advanced Open Water Diver (or have a qualifying certification from another training organization) and a PADI Rescue Diver (or have a qualifying certification from another training organization) with certification in four other PADI Specialty ratings.
5. Class requirements
- a. Cost of course [Explain all costs involved.]
  - b. Equipment needs. [List all the equipment students must provide and explain that the use of specific equipment will be discussed later in the course.]
  - c. Materials needed for the course
  - d. Attendance requirements
6. Administration
- a. Complete paperwork: enrollment, Standard Safe Diving Practices Statement of Understanding, PADI Medical Statement, Liability Release, and Assumption of Risk Agreement. [These should be filled out and signed, even if you have students who have completed them before as part of another course taken from you. The PADI Student Record file contains all of these forms and simplifies paperwork.]\_\_