

TDI – Extended Range Diver Course

1.1 Introduction

This course provides training and experience required to competently utilize air for dives up to one hundred and eighty (180) fsw / fifty five (55) msw that requires staged decompression, utilizing Nitrox mixtures or oxygen during decompression. The objective of this course is to train divers in the proper techniques, equipment requirements, and hazards of deep air diving to a maximum of one hundred eighty (180) fsw / fifty five (55) msw utilizing Nitrox mixtures or oxygen for staged decompression.

1.2 Qualifications of Graduates

Upon successful completion of this course, graduates may engage in decompression diving activities without direct supervision so long as:

1. The diving activities approximate those of training.
2. The areas of activities approximate those of training.
3. Environmental conditions approximate those of training.

Upon successful completion of this course, graduates are qualified to enroll in:

1. TDI Advanced Wreck Course.
2. TDI Entry Trimix Course.
3. TDI Advanced Trimix Course.

1.3 Who May Teach

Who may teach this course:

1. This course may be taught by any active TDI Extended Range Instructor.

1.4 Student – Instructor Ratio

Academic:

1. Unlimited, so long as adequate facility, supplies and time are provided to insure comprehensive and complete training.

Confined Water (Swimming pool-like conditions):

1. N/A.

Open Water (Ocean, lake, quarry, spring, river or estuary):

1. A maximum of four (4) students per Instructor. However, it is the instructor's discretion to reduce this number as conditions dictate.

1.5 Student Pre-Requisites

The student must:

1. Be a minimum age of eighteen (18).
2. Be certified as a TDI Advanced Nitrox Diver and TDI Decompression Procedures Diver (or equivalents) is required.

3. Have a minimum of one hundred (100) logged dives, of which twenty (25) must be deeper than one hundred (100) fsw / thirty (30) msw, or the equivalent at the discretion of the instructor.

1.6 Course Structure and Duration

Open Water Execution:

1. Six (6) dives with a minimum accumulated bottom time of one hundred (100) minutes.
2. All dives must be deeper than one hundred (100) fsw / thirty (30) msw with four (4) dives deeper than one hundred thirty (130) fsw / forty (40) msw.
3. No more than two (2) dives may be credited from previous training.

Course Structure:

1. TDI allows instructors to structure courses according to the number of students participating and their skill level.

Duration:

1. The minimum number of classroom and briefing hours is eight (8).

1.7 Administrative Requirements

The following is the administrative tasks:

1. Collect the course fees from all the students.
2. Ensure that the students have the required equipment.
3. Communicate the training schedule to the students.
4. Have the students complete the Liability Release and Medical history forms.
5. The Instructor should review the Liability Release and Medical Forms before starting on the course.

Upon successful completion of the course the Instructor must:

1. Complete the Student Registration Form and send the Registration Form to TDI HQ.
2. Award card and certificate.

1.8 Required Equipment

The following are required for this course:

1. TDI Extended Range Diver Manual.
2. Recommended additional reading: *Deep Diving; An Advanced Guide to Physiology, Procedures and Systems*, Revised 2nd edition 1995, by Bret Gilliam

The following equipment is required for each student:

1. Bottom Mix Cylinder(s)
 - A. Cylinder volume appropriate for planned dive and student gas consumption.
 - B. Dual outlet valve, double manifold or independent doubles.
 - C. Labeled in accordance with TDI Standards.
2. Travel Mix Cylinder(s) if used
 - A. Cylinder volume appropriate for planned dive and student gas consumption.
 - B. Labeled in accordance with TDI Standards.
3. Decompression Mix Cylinder(s)
 - A. Cylinder volume appropriate for planned dive and student gas consumption.
 - B. Labeled in accordance with TDI Standards.
4. Regulator(s)
 - A. Primary and primary redundant required on all bottom mix cylinders.

- B. Submersible pressure gauges are required on all primary / bottom mix cylinder(s).
- C. A contingency use long hose second stage should be designated and appropriately rigged to facilitate air sharing at depth if necessary.
- 5. Buoyancy Compensator(s) adequate for equipment configuration.
- 6. Redundant Depth and Timing Devices.
- 7. Air decompression computers allowed for use as depth and timing devices.
- 8. Redundant Light System if needed for site conditions.
- 9. Jon-line and other rigging lines as dictated by site conditions.
- 10. Ascent Reel with Lift Bag/Surface Marker Buoy
 - A. Adequate for maximum planned depth.
 - B. Minimum of twelve (12) kg/twenty five (25) lb. lift bag/surface marker buoy.
- 11. Exposure Suit adequate for the open water environment.
- 12. Line Cutting Device (2).
- 13. Underwater Slate (for decompression/contingency tables).

1.9 Required Subject Areas

The TDI Extended Range Manual is mandatory for use during this course but instructors may use any additional text or materials that they feel help present these topics. The following topics must be covered during this course:

- 1. History of Deep Air Diving.
- 2. Physics
 - A. Pressure Review.
 - B. Formulas for solving dive planning problems, MOD, best mix, etc.
- 3. Physiology
 - A. Hypoxia.
 - B. Oxygen toxicity
 - I. Whole body (OTUs).
 - II. Central Nervous System.
 - C. Nitrogen Narcosis.
 - D. Nitrogen Absorption and Elimination.
 - E. Carbon Dioxide Toxicity.
 - F. Carbon Monoxide.
 - G. Hyperthermia.
 - H. Hypothermia.
- 4. Decompression Options
 - A. Air.
 - B. Nitrox.
 - C. Oxygen.
- 5. Equipment Considerations
 - A. Twin cylinder or single cylinder option.
 - B. Stage cylinder options.
 - C. Regulator options.
 - D. Harness / BC options.
 - E. Computer / depth gauge / bottom timer options.
 - F. Ascent and navigation reels.
 - G. Lift Bags/surface marker buoys for drifting or free decompression.
 - H. Lights.
 - I. Redundant mask and knife.
 - J. Jon-line or Garvin clips.
- 6. Dive Tables

- A. Introduction and review of different models (Buhlmann, DCIEM, U.S. Navy recommended).
- B. Introduction to computer generated tables.
- 7. Dive planning
 - A. Operation Planning
 - I. Support.
 - II. Teams.
 - B. Team planning
 - I. Gas requirements.
 - II. Oxygen limitations.
 - III. Nitrogen limitations.
 - C. Emergency Planning
 - I. Omitted decompression.
 - II. Oxygen toxicity.
 - III. Decompression sickness.
 - IV. General.
- 8. Procedures
 - A. Bottom, Travel and Decompression Gas.
 - I. Normal Operations.
 - II. Failure, loss or inadequate emergency procedures.
 - III. Analysis and logging.
 - B. Descent
 - I. Methods of entry, down lines or free descent.
 - II. Recognizing narcosis.
 - III. Breathing.
 - IV. Organization of equipment carried on diver.
 - C. Ascent
 - I. Variable rates.
 - II. Trim and compensation.
 - D. Support.
 - E. Navigation
 - I. From shore.
 - II. From descent Line.
 - III. From live-a-board vessel.

1.10 Required Skill Performance and Graduation Requirements

The following open water skills must be completed by the student during open water dives:

The maximum depth for this course is one hundred eighty (180) fsw / fifty five (55) msw.

1. Properly analyze all gas mixtures to be used
2. Demonstrate adequate pre-dive planning
 - A. Limits base on personal and team gas consumption
 - B. Limits based on oxygen exposures at planned depths for actual mixes
 - C. Limits based on nitrogen absorption at planned depths for actual mixes
3. Properly execute the planned dive within all pre-determined limits
4. Demonstrate the proper procedures for switching and isolating a malfunctioning regulator. This skill is to be performed at a depth no deeper than one hundred thirty (130) fsw/ forty (40) msw
5. Demonstrate the proper navigational techniques for the specific dive
6. On two (2) dives, demonstrate an ascent with ascent reel and lift bag. Perform staged decompression
7. On one (1) of the dives, tow a simulated unconscious diver, while at depth, thirty (30) ft to ascent line and simulate an emergency rescue ascent technique

In order to complete this course, students must:

1. Satisfactorily complete the TDI Extended Range Course written examination.
2. Complete all open water requirements safely and efficiently.
3. Demonstrate mature and sound judgment concerning dive planning and execution