



PSAI ADVANCED PRINCIPLES OF NITROX DIVING

2 days

Costs include:

Extra costs: Equipment, Certification

I. Course Description

The **Professional Scuba Association International's** Nitrox Diver course is designed for those divers who concentrations up to and including wish to utilize enriched air (Nitrox) at oxygen concentrations up to and including 100% oxygen by volume.

II. Course Objectives and Qualifications

This course provides the necessary information for a **PSAI** diver to know the proper procedures to:

- A. Determine appropriate Nitrox gas for planned dives;
- B. Determine appropriate diving equipment for planned Nitrox dives;
- C. Plan dives based on established limits and cautions for Nitrox gases;
- D. Analyze and verify Nitrox gases for diving.

A diver that successfully completes this **PSAI** Nitrox Diver program will be qualified to:

- A. Plan and conduct dives with Nitrox mixtures up to and including 100% oxygen;
- B. Obtain appropriate Nitrox gases, up to 100% oxygen, for diving.

III. Instructor Qualifications

An active status (membership current and appropriately insured) **PSAI** Nitrox instructor, or higher, may teach the **PSAI** Nitrox Diver course.

IV. Prerequisites for Course Entry

A. Age

The student shall be of legal age of majority, or if younger with the appropriate parental/guardian permission, at time of course entry.

B. Certification

The student shall have graduated from a minimum of an internationally recognized Open Water course.

C. Prior Dive Experience

No dives other than those required for Open Water certification are required for entry into the **PSAI** Nitrox Diver course.

D. Special Notes

This course may be taught in conjunction with an internationally recognized Open Water course at the discretion of the PSAI Instructor.

V. Student to Instructor Ratio

A. Classroom

No specific limits are in place for classroom and lecture, as long as the facilities provide the necessary comfort and environment for proper teaching of academic material.

B. Practical Session

This course requires the student to demonstrate the proper use of an oxygen analyzer. The class may be sub-divided into multiple groups to allow for practical dive planning, equipment marking and oxygen analysis as long as sufficient qualified assistants and equipment are available to monitor all questions.

C. Open Water Dives

There shall be no more than 6 students per **PSAI** instructor, 2 additional students may be added with the addition of an appropriately certified assistant, limited to 8 maximum.

VI. Course Minimums and Standards

A. Classroom Hours

Approximately four (4) hours for classroom and practical demonstration (oxygen analysis and equipment marking) are required for the **PSAI** Nitrox Diver course.

B. Open Water Dives

Two (2) Nitrox dives are required for the **PSAI** Nitrox Diver course. Each dive shall have a minimum run time of 20 minutes. The **PSAI** instructor may waive the dives if he makes a written exception on the diver's record based on diving background and experience to maintain proper buoyancy control and recognition of maximum operating depths.

C. Course Limitations

1. This course is limited to breathing gas oxygen concentrations up to 100% by volume;
2. All dive mixes shall ensure that the student does not exceed an oxygen exposure greater than 1.6 bar (ata);
3. All dive exposures shall be in accordance with the established NOAA time limits;
4. All dives are limited to a maximum depth of 40 meters (132 feet).

VII. Course Instructional Materials Requirements

- A. All students will use the **PSAI** Nitrox Diver manual and **PSAI** EAD Tables
- B. **PSAI** Nitrox Instructors will use this standard and the **PSAI** Nitrox Diver Course Guide, as a minimum.

VIII. Course Equipment Requirements

- A. Standard equipment appropriate for the environment of the Nitrox dive.
- B. Oxygen Analyzer equipped with an appropriate flow destructor assembly/interface. An

additional oxygen analyzer without an appropriate flow restrictor assembly/interface may also be shown, but only as an adjunct. The instructor should demonstrate how these secondary devices, if used, may result in inaccurate measurements.

- C. Nitrox cylinder(s), appropriately cleaned, marked and maintained.

IX. Curriculum Requirements

The **PSAI** Nitrox Diver course requires the use of the **PSAI** Nitrox Diver manual.

This manual will have all the necessary information to appropriately cover, in the detail necessary for this level of certification, the following areas of information:

A. History of Enriched Air Diving

1. Early uses of Nitrox
2. Popular acceptance of Nitrox
3. PSAI's involvement in Nitrox Education

B. Physical Principles of Enriched Air Diving

1. Pressure
2. Boyle's Law
3. Dalton's Law

C. Physiological Principles of Enriched Air Diving

1. Benefits of Nitrox
2. Hazards of Excess Oxygen

D. Equipment for Enriched Air Diving

1. Standard Equipment
2. Cylinder Considerations
3. Manufacturer's Recommendations

E. Dive Planning

1. Equivalent Air Depth and Tables
2. Use of Dive Computers

F. Methods of Generating Nitrox

1. Partial Pressure
2. Continuous Blend Technique
3. Gas Permeable Membrane Technique
4. Pre-mixed Gas

G. Using Nitrox

1. Gas analysis
2. Limits Maximum Operating Depth
3. Dive Shop/boat Procedures and Logging

X. Skill Requirements

A. Land Based

A **PSAI** Nitrox Diver student shall:

1. Plan Nitrox dives based on specified gases and dive depths;

2. Properly analyse Nitrox gas;
3. Verify equipment suitability and markings.

B. Open Water

A **PSAI** Nitrox Diver student shall:

1. Conduct the dives according to their plan, as approved by the **PSAI** instructor;
2. Monitor gas pressures and surface with an acceptable safe margin;
3. Not exceed any Maximum Operating Depth limitations;
4. Not exceed any Oxygen Exposure limitations.

XI. Course Completion Performance Requirements

To be awarded the **Professional Scuba Association International's** Nitrox Diver certification, the student must:

1. Attend all academic sessions;
2. Correctly demonstrate proper calibration of an oxygen analyzer and then properly analyze the oxygen content of two (2) different Nitrox cylinders plus any cylinder used for a Nitrox dive;
3. Complete the **PSAI** Nitrox Diver written examination with all questions correctly answered or remediated and explained;
4. Conduct the own water dive with appropriate skill and attention to all dive parameters to the satisfaction of the **PSAI** instructor.

The **PSAI** instructor is responsible for ensuring that the Nitrox Diver student has demonstrated the appropriate respect and understanding for diving with hyperoxic diving gases. If the student fails to maintain proper depth control, gas management awareness, etc., the instructor must require additional training until the appropriate standards are achieved prior to certification.