part 2

PFI Diver Standards

pfi diver standards

Revision History

Revision Number	Date	Changes
0719	07/01/20019	Initial Standards
0120	01/01/2020	4.12.1, 5.12.1, 7.12.1, 8.12.1 Content Replaced, note added
0720	07/24/2020	Changes affecting PFI standards for mid second quarter 2020 include reducing and correcting student to instructor ratios with Assistant Instructors, allowing the use of manikins to perform safety skills, increase the distance a safety buddy may be from the diver, change the method of coaching recovery breathing, established most skills as graduation requirements, corrected minor formatting errors and typographical mistakes.
0121	01/01/2021	Corrected minor typographical errors
0221	02/01/2021	No changes
0122	01/01/2022	4.7 Edited to reflect use of multiple Assistant Instructors 4.13.3.a. Removed references to hard or soft kicks 5.1 Removed "Surface" from "Surface Safety Skills" 5.2 Paragraph replaced 5.7 Section expanded upon 5.12.3.d Text replaced 5.13 Removed references to hard or soft kicks, added "Count" to each point 5.13.5.c.v Replaced existing text with “Proper kick cycles to 20 metres / 66 feet” 5.14.4.i.v.3 Removed “ – 6 strong kick cycles – 6 soft kick cycles – 5 seconds intermittent kicks” 5.14.4.i.v.4 Item Clarified, "Instructor Must:" section added 8.12.2.b. Replace existing text with “Descend with appropriate kick cycles lasting 30 seconds.” 8.13.3.a.i. 1-3, 8.13.5.b.iv, Removed references to hard or soft kicks

1. Snorkeler

1.1 Introduction

This entry level certification course is for individuals wishing to learn the basics of surface snorkeling or limited skin dives for the purpose of enjoying the underwater realm in a knowledgeable and comfortable manner.

1.2 Course Objectives

The objective of this course is to train individuals in the benefits, skills, techniques and safety & problem management for snorkeling or limited skin diving to depth no greater than 5m / 16 ft.

1.3 Program Prerequisites

1. Minimum age of 6
2. Competent swimming skills

1.4 Required Student Equipment

1. Mask, fins, snorkel, exposure protection, weight belt and weights appropriate for local environment
2. The use of a snorkel vest is optional

1.5 Support Materials

Student materials

1. *PFI Liability and Assumption of Risk form*
2. *PFI Medical Statement*
3. *PFI Snorkeler* eLearning course

Instructor materials

1. There are no required instructor materials for this course.

1.6 Qualification of Graduates

1. Upon successful completion of this course, graduates may engage in snorkeling or skin-diving activities with a buddy without direct instructor supervision and to depths no greater than 5 m/16ft.
2. Upon successful completion of this course, graduates are qualified to enroll in the Freediver course.

1.7 Who May Teach

This course may be taught by any active PFI Freediver Instructor.

1.8 Student to Instructor Ratio

Classroom

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

Confined water

1. A maximum of eight students to one PFI Freediver Instructor (8:1). Or a maximum of twelve students to one PFI Freediver Instructor (12:1 max) with the use of active status PFI Assistant Freediver Instructors

Open Water

1. A maximum of six students to one PFI Freediver Instructor (6:1). Or a maximum of ten students to one PFI Freediver Instructor (10:1 max) with the use of active status PFI Assistant Freediver Instructors

1.9 Depth Restrictions

Open Water

1. Maximum open water depth of 5 meters / 16 ft

Confined Water

1. Minimum depth to not exceed student's ability to stand. Maximum depth of 5 meters/16 ft.

1.10 Recommended Course Minimums

Classroom time

1. 1.5 Hours

Confined water time

1. 1.5Hours

Open water dive time

1. 2.0 Hours (optional)

1.11 Knowledge Development Overview

The following topics must be covered during this course Instructors may use any additional text or materials that they feel help present these topics.

1. Introduction:
    a. Course Overview
    b. Paperwork and Prerequisites
    c. Equipment Requirements Check
    d. Pool Protocols and Conduct
    e. In-water Protocols and Conduct
    f. Safety / Supervision Practices
2. Equipment Options:
    a. Masks, Fins, Snorkels
    b. Exposure Protection
    c. Buoyancy Systems
3. In-Water Environment:
    a. Local aquatic animal and plant life
    b. Environmental conditions

4. Safety & Problem Management for Snorkel / Skin Diving:
    a. Buddy contact
    b. Cramp removal
    c. Tired snorkeler / skin diver
    d. Surface signals
5. In-Water Training Exercises:
    a. Equalization techniques
    b. Communication

1.12 Confined Water

To be certified as a PFI Snorkeler a student must demonstrate the following skills to the satisfaction of the PFI Instructor:

1. Watermanship Skills:
    a. Swim 25 meters without snorkeling gear.
    b. Tread water for a minimum of 1 minute without floatation.
    c. Prepare snorkeling equipment with minimal assistance.
    d. Successfully complete one of the following entries applicable to local environment:
        i. Reverse Walk In.
        ii. Seated Entry.
2. Mask and Snorkel use:
    a. Snorkel breathing with and without mask.
    b. Snorkeling clearing using blast and displacement methods.
    c. Partial mask clear at surface.
3. Buoyancy Device
    a. Snorkel Vest inflation/ deflation (only required if snorkel vest is used)
4. Surface Swimming- use of fins:
    a. Proper fin use / flutter kick
    b. Surface swim for 25 meters showing proper buddy contact
    c. Dolphin kick (optional)
5. Optional Freedive (max depth 5m):
    a. Breathing techniques
        i. 3-4 relaxed, deep breaths
        ii. Final breath
    b. Surface dive

   c. Equalization
   d. Head down descent
   e. Complete body submersion
   f. Raised hand ascent method
   g. Displacement / blast method snorkel clearing
6. Problem Management:
   a. Assist with tired snorkeler / skin diver
   b. Cramp removal
   c. Surface signal for assistance

1.13 Open Water (Optional)

The following are optional open water skills for the PFI Snorkeler certification. A student can demonstrate the following skills to the satisfaction of the PFI Freediver Instructor:

1. Mask and Snorkel use:
   a. Snorkel breathing with and without mask.
   b. Snorkeling clearing using blast and displacement methods.
   c. Partial mask clear at surface.
2. Buoyancy Device
   a. Snorkel Vest inflation/ deflation (only required if snorkel vest is used)
3. Surface Swimming- use of fins:
   a. Proper fin use / flutter kick
   b. Surface swim for 25 meters showing proper buddy contact
   c. Dolphin kick (optional)
4. Surface dives:
   a. Breathing techniques
      i. 3-4 relaxed, deep breaths
      ii. Final breath
   b. Surface dive (duck dive)
   c. Equalization
   d. Head down descent
   e. Complete body & equipment submersion
   f. Raised hand ascent method
   g. Displacement snorkel clearing
5. Problem Management:
   a. Cramp removal with tired snorkeler assist

1.14 Graduation Requirements

In order to successfully complete this course a student must:

1. Complete all of knowledge development and confined water sessions
2. Complete all required skills.
3. Demonstrate mature and sound judgment concerning planning and execution.
4. Prepare snorkeling equipment with minimal assistance.
5. Successfully complete one of the following in-water entries applicable to local environment:
    a. Reverse Walk In
    b. Seated Entry

2. Introduction to Freediving

2.1 Introduction

This is program is designed as an experience only program and is not intended to teach specific skills or provide certification. A respect for the safety and problem management of freediving should be relayed as well as an appreciation an excitement for furthering a participant's education in a proper full certification program.

2.2 Course Objectives

The objective of this course is to show and give examples of the benefits, skills, techniques and safety & problem management for all facets of freediving and to provide an experience with basic level static apnea to a maximum of 2:00min and/or a dynamic apnea of 25m / 82 ft.

2.3 Program Prerequisites

1. Minimum age 10 years.
2. Comfortable in the water.

2.4 Required Student Equipment

1. Mask
2. Fins and Snorkel (optional)
3. Exposure protection (appropriate for local environment)
4. A timing device (optional)

2.5 Support Materials

Student materials

1. *PFI Medical Statement*
2. *PFI Liability and Assumption of Risk form*

Instructor materials

1. *PFI Freediver* Instructor Manual
2. *PFI Introduction to Freediving* PowerPoint

2.6 Qualification of Graduates

1. Upon successful completion of this course, graduates are qualified to enroll in the Safe Buddy or Freediver courses.

2.7 Who May Teach

This program may be taught by any active PFI Freediver Instructor.

2.8 Student to Instructor Ratio

Classroom

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

Confined Water

1. A maximum of eight students to one PFI Freediver Instructor (8:1). Or a maximum of twelve students to one PFI Freediver Instructor (12:1 max) with the use of active status PFI Assistant Freediver Instructorst

2.9 Depth Restrictions

Confined Water

1. Maximum confined water depth of 5 meters / 16 ft

2.10 Recommended Course Minimums

Classroom time

1. 1.5 Hours

Confined water time

1. 2.0 Hours

2.11 Knowledge Development Overview

The following topics must be covered during this course. Instructors may use additional texts or any materials that they feel help present these topics.

1. Introduction
    a. Course Overview
    b. Paperwork and Prerequisites
    c. Equipment Requirements Check

   d. Pool Protocols and Conduct
   e. In-water Protocols and Conduct
   f. Safety / Supervision Practices
2. History of Freediving
   a. Origin and History of Freediving
   b. Freediving Records and Competitions
3. Why Freedive?
   a. Recreation, photo/video, marine harvest, competition…
4. Equipment Introduction for Freediving
   a. Basic to advanced equipment introduction
5. Introduction to In-Water Environment
   a. Local aquatic animal and plant life & environmental conditions
6. Physics & Physiology of Freediving
   a. Introduction to the physics and physiology of freediving
7. Safety & Problem Management for the Freediver Course
   a. Direct supervision
   b. Hypoxia and blackouts
   c. Introduction to static, dynamic and depth procedures
   d. Safety signals and procedures for static apnea

2.12 Confined Water

No certification exists for this program and no students' objectives are required except for instilling a respect and appreciation for safety procedures:

1. Prepare freediving equipment with the assistance of the instructor
2. Basic elements of static and/or dynamic apnea
3. Maximum of 3-4 static breath-holds with proper supervision.
4. Complete a maximum of 2:00 static apnea
5. Dynamic apnea streamlining & kick technique with proper supervision
6. Complete a maximum of a 25m/82ft dynamic apnea
7. Complete all safety under the direct supervision and assistance of an instructor

2.13 Graduation Requirements

There are no graduation requirements for this program.

3. Safe Buddy

3.1 Introduction

This program is designed to educate uncertified Freedivers and/or water professionals, such as lifeguards, charter boat operators, and scuba professionals, in the safety and rescue techniques necessary for Freediving. The program does not include any instruction on increasing Freediving performances or improving form.

3.2 Course Objectives

The objective of this program is to increase Freediving safety awareness for uncertified Freedivers and to enhance their overall safety when diving within recreational Freediving limits.

3.3 Program Prerequisites

1. Minimum age of 10 for Junior Safe Buddy or 16 years for full Safe Buddy
2. Competent swimming skills
3. PFI Snorkeler / Skin Diver or equivalent skill level

3.4 Required Student Equipment

1. Mask
2. Fins
3. Snorkel
4. Wetsuit
5. Weights and belts optional
6. Timing device
7. Any specialty equipment deemed necessary by the local environment or specifics of the training session such as lanyards.

3.5 Support Materials

Student materials

1. *PFI Liability and Assumption of Risk form*
2. *PFI Medical Statement*

Instructor / support systems

1. Optional manikin for rescue scenarios
2. BLS/First Aid support equipment

3.6 Qualification of Graduates

1. Upon successful completion of this training session the participant receives a Safe Buddy certification, stating that the diver has received safety training.

3.7 Who May Teach

This program may be conducted by any active PFI Freediver Instructor.

3.8 Student to Instructor Ratio

Classroom / Briefing

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

Confined water

1. A maximum of eight students to one PFI Freediver Instructor (8:1). Or a maximum of twelve students to one PFI Freediver Instructor (12:1 max) with the use of active status PFI Assistant Freediver Instructors.

Open Water

1. There is no open water session for this course.

3.9 Depth Restrictions

Confined Water

1. Maximum confined water depth of 10m / 33ft.

3.10 Recommended Course Minimums

Classroom time:

1. 1 Hour

Confined water time:

1. 2.0 Hours

3.11 Knowledge Development Overview

The following topics must be briefed during the training session. Instructors may use additional texts or any materials that they feel help present these topics.

1. Introduction:
    a. Course Overview
    b. Paperwork and Prerequisites
    c. Equipment Requirements Check
    d. In water Protocols and Conduct
    e. Safety / Supervision Practices
2. Course Overview:
    a. Welcome
    b. Objectives
    c. Responsibilities
        i. Conduct yourself in a safe and responsible manner as outlined by your training level
        ii. Provide back-up safety according to your level if a situation or accident would require
3. Paperwork and Prerequisites:
    a. Participant Information
    b. Liability Form
    c. Medical Form
    d. Standard Safe Freediving Practice Statement of Understanding
4. Equipment Requirements Check:
    a. Mask, fins, snorkel
    b. Exposure protection for local environment
    c. Weights and weight belt (optional)
    d. Appropriate timing device
5. Safety & Problem Management:
    a. Freediving Supervision
        i. Direct Supervision
        ii. One buddy up and one down
        iii. Supervision for 30 seconds at the surface
    b. Safety for Constant Ballast
        i. Remain close enough to protect the airway
        ii. Time your buddy's dive
        iii. Know which direction they are heading while underwater
        iv. 90% of LMC & BO happen at surface

c. Safety signals for Static
    i. Agree on signal
    ii. Watch for signal as you tap your buddy
    iii. Watch for weak or no signals
    iv. Watch for air release
    v. The two chances rule
    vi. Signals: 1 min before; 30 sec before; at announced time; every 15 sec thereafter
d. Safety for Dynamic (Optional)
    i. Keep pace at surface with kickboard
    ii. Watch body style
    iii. Watch for air release
e. Recovery breathing
    i. Static/Dynamic recovery breaths
    ii. Constant ballast recovery breaths
f. Buoyancy for Safety
    i. Buoyant at surface
    ii. Never completely sink when exhaling to relaxed volume at surface
g. Buddy Separation
    i. At the surface
    ii. Gain height- give OK signal
    iii. Whistles
    iv. Call name
    v. Underwater
    vi. Call for assistance
    vii. Triangulate position
    viii. Search patterns
    ix. Dives within your limitations
h. LMC & Surface Blackout
    i. Depth vs. Static Hypoxia
    ii. Near Blackout/LMC/Samba
        1. Signs and symptoms
    iii. Assisting a near blackout at the surface
        1. Provide support
        2. Talk
        3. Remove mask if possible

iv. Blackouts
    1. Signs and symptoms
v. Assisting Blackouts at the surface
    1. Link up
    2. Remove mask
    3. 3 blow/tap/talks
    4. Artificial Respiration and Evacuation
vi. Surface response to underwater blackout

3.12 Confined Water

To be certified as a Safe Buddy a student must demonstrate the following skills to the satisfaction of the PFI Instructor:

1. Responding to LMC's & BO's
    a. Assist ascending diver
    b. Assist with a simulated surface LMC as a safety.
        i. Physically support the freediver
        ii. Keep one hand on the chest above the waterline but below the chin.
        iii. Speak calmly to encourage the freediver to breathe.
    c. Respond to a simulated blackout at the surface.
        i. Place the freediver on their back with the airway protected.
        ii. Securely support their head and body.
        iii. Blow, Tap, Talk 3 times.
    d. Assist with a simulated underwater blackout
        i. Physically support the freediver.
        ii. Ensure proper hand placement.
        iii. Protect the airway.
2. Static Apnea
    a. Demonstrate basic elements of static safety including:
        i. Timing and safety signals
        ii. Recovery coaching
    b. Problem management for Static
        i. Simulated LMC scenario
        ii. Simulated BO scenario
        iii. Complete a full static apnea rescue with BLS egress

3. Dynamic Apnea (optional)
    a. Demonstrate basic elements of dynamic safety including:
        i. Buddy positioning
        ii. Recovery coaching
    b. Demonstrate problem management for dynamic apnea including:
        i. Simulated LMC scenario
        ii. Simulated BO scenario
        iii. Complete a full dynamic apnea rescue with BLS egress
4. Constant Ballast
    a. Demonstrate basic elements of constant ballast safety including:
        i. Recovery coaching
        ii. Position and proximity
    b. Problem management for constant ballast
        i. Simulated LMC scenario at surface
        ii. Simulated BO scenario at surface
        iii. Surface response to underwater blackout
        iv. Rescue tow with unconscious diver
        v. Airway control and in-water BLS management
        vi. Egress and victim removal / transport

3.13 Graduation Requirements

In order to successfully complete the Safe Buddy program Freedivers must:

1. Attend all knowledge sessions and confined water sessions
2. Demonstrate proficiency in in-water training sessions
3. Demonstrate proficient rescue techniques on rescue scenario
4. Demonstrate mature and sound judgment concerning planning and execution.

4. Freediver

4.1 Introduction

This is the entry-level certification course is for individuals wishing to learn the fundamentals of proper breath hold diving for the purpose of increasing underwater awareness and enjoyment. An introduction to open water Freediving skills and techniques to depths no deeper than 20m / 66' are practiced with the program also encompassing static and dynamic apnea as introductory or stand-alone disciplines. A pool only certification may be issued to those not wishing to participate in open water training.

4.2 Course Objectives

The objective of this course is to train individuals in the benefits, skills, techniques and safety and problem management for entry level Freediving to a depth of 20m / 66 ft, with basic level static apnea development of 1:30 at a minimum and an optional dynamic apnea development of 25m / 82 ft.

4.3 Program Prerequisites

1. Minimum age of 10 for Junior Freediver or 16 years for Freediver
2. Competent swimming skills
3. PFI Snorkeler or equivalent skill level

4.4 Required Student Equipment

1. Mask, Fins, Snorkel
2. Exposure protection appropriate for local environment
3. Weight belt and weights appropriate for local environment
4. Timing device (preferred freediving computer or depth gauge)

4.5 Support Materials

Student materials

1. *PFI Medical Statement*
2. *PFI Liability and Assumption of Risk form*
3. *PFI Freediver* Manual or eLearning

Instructor materials

1. *PFI Freediver* Instructor Manual
2. *PFI Freediver* Instructor Guide

4.6 Qualification of Graduates

1. Upon successful completion of this course, graduates may engage in buddy supported freediving activities appropriate for the environment without direct supervision of an instructor to depths no greater than 20 meters/66 ft.
2. Upon successful completion of this course, graduates are qualified to enroll in the Freediver Coaching, Intermediate Freediver, Open line Diving and Specialty Freediver programs.
3. Divers may be certified with a Freediver-Pool Only certification after successfully completing all knowledge Development and Confined Water training sessions. There is no open water training necessary for this level of certification and divers at this level are not certified for any open water activities.

4.7 Who May Teach

This course may be taught by any active PFI Freediver Instructor. The PFI Freediver Instructor may use active status PFI Assistant Instructors to increase student ratios.

4.8 Student to Instructor Ratio

Classroom

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

Confined Water

1. A maximum of eight students to one PFI Freediver Instructor (8:1). Or a maximum of twelve students to one PFI Freediver Instructor (12:1 max) with the use of active status PFI Assistant Freediver Instructors

Open Water

1. A maximum of six students to one PFI Freediver Instructor (6:1). Or a maximum of ten students to one PFI Freediver Instructor (10:1 max) with the use of active status PFI Assistant Freediver Instructors

4.9 Depth Restrictions

Open Water

1. Maximum open water depth of 20 meters / 66 ft.

Confined Water

1. Maximum confined water depth of 10 meters / 33 ft.

4.10 Recommended Course Minimums

Classroom

1. 6.0 Hours

Confined Water

1. 5.0 Hours

Open Water

1. 5.0 Hours

4.11 Knowledge Development Overview

The following topics must be covered during the course. Instructors may use additional texts or materials they feel help present these topics.

1. Introduction
    a. Participant and Staff Introductions
    b. Course Overview
    c. Paperwork and Prerequisites
    d. Equipment Requirements Check
    e. Classroom, Confined and Open Water Protocols and Conduct
    f. Safety / Supervision Practices
2. History of Freediving
3. Safety & Problem Management
    a. Freediving supervision
        i. Direct Supervision
        ii. One buddy up and one down
    b. Safety for depth freediving
        i. Being prepared
        ii. Remain close enough to PROTECT THE AIRWAY!
        iii. Time your buddies dive
        iv. Know which direction they are heading while under
        v. Rule of 9's

c. Safety and signals for static apnea
    i. Signal Agreement
    ii. Proper Signaling
    iii. Two strikes rule
    iv. Air release (loss of airway control)
    v. Target time and signals
    vi. Exiting a static apnea
    vii. Loss of Motor Control (LMC)/Blackout (BO)
d. Safety for dynamic (optional)
    i. Safety Positioning
    ii. Watch body style
    iii. Loss of airway control
    iv. Loss of Motor Control (LMC) /Blackout (BO)
e. Loss of Motor Control (LMC) and Blackout
    i. Depth Hypoxia vs. Apnea Hypoxia
    ii. Near Blackout, LMC, and Samba
    iii. Assisting an LMC at the Surface
    iv. Blackouts
    v. Assisting Blackouts at the surface
    vi. Responding to Bailouts and Blackout below surface
f. Buddy separation
    i. At the surface
    ii. Underwater

4. Breathing
    a. Respiratory muscles
        i. Diaphragm
        ii. Intercostals
        iii. Subclavian (scalene)
    b. Correct breathing cycles
        i. Normal ventilations
        ii. Ventilations
        iii. Purging
        iv. Peak Inhalation
        v. Recovery breathing
    c. Recovery breathing
        i. What is Recovery Breathing?
            1. Six most important breaths
            2. Upper chest
            3. Gas exchange and maintains cerebral blood circulation

4. Cleansing VS Hook breaths; 6Cleans VS 3Hook + 3 Cleans

ii. Static / Dynamic recovery breaths
1. Cleansing breaths

iii. Constant Ballast recovery breaths
1. Hook breaths; held for 3 seconds at full inhalation

d. Anxiety stimulus
i. Causes
1. Physical Stress
2. Physiological Stress
3. Psychological Stress

ii. Stress Reduction

5. Equipment for Freediving
a. Masks
i. Volume
ii. Fit
iii. Materials and types
iv. Maintenance

b. Fins
i. Blade length
ii. Materials and types
iii. Maintenance

c. Snorkels
i. Features
ii. Placement
iii. Submersion protocol
iv. Maintenance

d. Exposure protection
e. Wetsuits
i. Features
ii. Materials and types
iii. Maintenance

f. Hoods
i. Materials and types
ii. Equalizing

g. Gloves
i. Features
ii. Materials and types

h. Socks
    i. Features
    ii. Materials and types
i. Timing devices
    i. Waterproof Timers
        1. Features of watches
        2. Features of freediving computers
j. Weight systems
    i. Materials and Types
    ii. Weights
    iii. Placement
    iv. Buckles
    v. Accessories and maintenance
k. Buoyancy systems
    i. Snorkeling vests features and types
l. Lines, flags and floats
    i. Diver Below Flag
    ii. Alpha Flag
    iii. Floats & Lines
m. Accessory freediving equipment
    i. Freediving knives and placement
    ii. Lights and markers
    iii. Goodie bags and stringers
n. In-Water Environment
    i. Local aquatic animal and plant life
    ii. Local environmental conditions
        1. Water type
        2. Temperature and thermoclines
        3. Visibility
        4. Wind, waves and currents
        5. How to assess and plan accordingly
    iii. Local freediving procedures
        1. Boat/shore freediving
        2. In-water procedures
        3. Entry/exit procedures

6. Physics & Physiology of Freediving
    a. Pressure & volume changes
        i. Boyle's Law and its effects on a freediver

ii. Pressure and Body Air Spaces
    1. Pressure on rigid air space
        a. Sinuses
        b. Ears
    2. Pressure on semi-rigid airspaces
        a. Lungs
        b. Stomach / gastrointestinal
iii. Pressure and Equipment Air Spaces
    1. Mask and goggles
    2. Wetsuit compression

b. Equalization Techniques – body
    i. Equalizing Ears & Sinuses
    ii. Three methods of Equalizing and most preferred
        1. Frenzel
        2. Valsalva
        3. Swallowing, Yawning, Jaw Thrust
        4. Frequency
        5. Losing air during equalizing
    iii. Equalizing Issues
        1. Ears vs sinuses
        2. "Noisy" ears and unequal equalizing
    iv. Masks
        1. Frequency
        2. Recapturing air upon ascent

c. Pressure Related Injuries - barotrauma
    i. Barotitis Media
        1. Symptoms
        2. Causes
        3. Treatment
    ii. Sinus Squeeze
        1. Symptoms
        2. Causes
        3. Treatment
    iii. Perforated Eardrum
        1. Symptoms
        2. Causes
        3. Treatment
    iv. Reverse Block
        a. Symptoms
        b. Causes
        c. Treatment

v. Mask Squeeze
    1. Symptoms
    2. Causes
    3. Treatment

d. Buoyancy
    i. Archimedes Principle
    ii. Three States of Buoyancy
        1. Positive – Safety / technique
        2. Neutral – 10m / 33ft
        3. Negative – Safety / technique
    iii. Things that effect buoyancy
        1. Lung volume
        2. Wetsuits
        3. Weights
        4. Body type
        5. Salt vs fresh
    iv. Buoyancy Checks
        1. Surface 'collar bone' rule of thumb
        2. Slight positive at 5m/16ft
        3. Neutral at 10m/33ft

e. Types & causes of blackouts
    i. Insufficient oxygen to the brain to support higher function
    ii. Recovery Blackout
        1. 90% - Critical hypoxia or Pulmonary Dump
        2. Insufficient recovery breathing
        3. Blood pressure disruption
    iii. Ascent Blackout
        1. 10% (9% & 0.9%) – Critical hypoxia or 'Vacuum Effect'
        2. Rapid lung volume expansion and rapid drop in partial pressures

7. Aquatic adaptations
    a. Bradycardia
    b. Splenic contractions
    c. Blood shunt (peripheral constriction)
8. In-Water Training Exercises
    a. Confined Water Skills & Techniques
    b. Open Water Skills & Techniques
    c. Communications

4.12 Confined Water

To be certified as a PFI Freediver students must demonstrate the following skills to the satisfaction of the PFI Instructor:

1. Watermanship and Stamina (May be completed in open water. If done in open water, must be completed prior to any other open water skills)
    a. Distance swim of 200 metres non-stop using any stroke without the use of swimming aids (mask or swim goggles may be used), **or** 300 metres nonstop using mask, snorkel, and fins
    b. Tread water for 10 minutes without floatation

Note: If an exposure suit is worn for any of the above skills, the wearer must be neutrally buoyant at the surface.

2. Snorkel breathing
    a. Swim continuously at the surface without a mask for a minimum of 25m without removing face from the water while breathing continuously through the snorkel
3. Open Water Freedive Simulation
    a. Breathe up
    b. Descent with proper head position
    c. Equalizing at the surface and on the way down to the bottom of the pool
    d. Relaxed bottom kicking for 10 sec
    e. Ascent with proper head position
    f. Drop arms at 10m (simulated depth) and shallower
    g. Assist with a simulated surface LMC as a safety
        i. Physically support the freediver
        ii. Keep one hand on the chest above the waterline but below the chin.
        iii. Speak calmly to encourage the freediver to breathe.
    h. Respond to a simulated blackout at the surface
        i. Protect airway with "head sandwich"
        ii. Place freediver on their back into the "dosey-doe" position
        iii. Remove their mask
        iv. Blow, Tap, Talk 3 times
    i. Assist with a simulated underwater blackout
        i. Recognize freediver underwater signaling for assistance
        ii. Freedive, take control of the freediver asking for assistance
        iii. Recognize blackout before surfacing
        iv. Protect the airway with a "head sandwich"

v. Place freediver on their back into the "dosey-doe" position
vi. Remove their mask
vii. Blow, Tap, Talk 3 times
viii. 2 simulated rescue breaths

4. Static and Dynamic Apnea
    a. Static apnea
        i. As a breath-holder student must complete a minimum of 4 consecutive static breath-holds
            1. 1st session:
                a. Vent – hold ratio;
                    i. 1min - 1min
                    ii. 3min - 2min
                    iii. 3min - 2:30min
                    iv. 4min – 3min
            2. 2nd session (optional)
                a. Vent – hold ratio:
                    i. 3min – 2min; 4min – 3min, 5min – 4min
        ii. Complete a minimum 1:30 static apnea, not exceeding 4:00, without any hypoxic symptoms
        iii. As a safety student must complete:
            1. Buddy supervision
            2. Timing and safety signals
            3. Recovery breathing and support assistance
    b. Dynamic apnea (optional)
        i. As a breath-holder student must complete a minimum of 3 dynamic performances
            1. Vent – distance ratio:
                a. 1min – 25m
                b. 2min – 25m + turn
                c. 2min – 50m
            2. Streamlining and kicks appropriate for dynamic
            3. Complete a minimum 25m dynamic apnea, not exceeding 75m, without any hypoxic symptoms
            4. As a safety student must complete:
                a. Surface safety with floatation
                b. Recovery breathing and surface support assistance

4.13 Open Water

The following open water skills are to be briefed, evaluated, practiced and debriefed by the PFI Freediver Instructor and/or certified active PFI Assistant Freediver Instructor as outlined in the General Standards and Procedures section.

- During all skills students will act in a buddy team, surface safety and breath holder.

To be certified as a PFI Freediver a student must demonstrate the following skills to the satisfaction of the PFI Instructor as follows:

1. Open Water Training Sessions
    a. A minimum of one (1) open water session must be completed with two (2) recommended
2. Weighting and Buoyancy
    a. Establish positive buoyancy at approximately 5m/16ft after 1st level exhalation without sculling, finning, treading, or pushing off plate
    b. Establish neutral buoyancy at approximately 10m/33ft with peak inhalation without sculling, finning, treading, or pushing off plate
3. Fin Use
    a. Introduce proper kick cycles determinations to landmark depths
        i. landmark 10m/33ft kick cycles
        ii. landmark 15m/50ft and 20m/66ft kick cycles (optional)
    b. Dolphin kick (optional)
4. Free Immersion Warm-up Dives
    a. Complete a minimum of four (4) free immersion style freedives as a warm-up
    b. Reach a minimum of 10m/33ft without barotrauma or hypoxic symptoms
        i. Breathe up properly.
        ii. Remove snorkel
        iii. Descend using double or single leg descents.
        iv. Ensure proper head position.
5. Complete six constant ballast dives
    a. Reach a minimum of 10m/33ft without barotrauma or hypoxic symptoms
        i. Surface breathing and preparation
        ii. Remove snorkel
        iii. Double leg, or single leg raised entry

6. Demonstrate proper descent procedures
    a. Stay within arm's reach of descent line
    b. Face line during descent
    c. Maintain proper head neutral position
    d. Equalize frequently with arm tucked
    e. Descend at approximately 1m / 3ft a second
    f. Practice kick-cycle speed and depth determination
    g. Utilize line for an effective bottom turn
7. Demonstrate proper ascent procedures
    a. Double raised hands if flexibility and comfort allow
    b. Drop arms at 10m – 5m / 33ft – 16ft
    c. Recapture expanding air from mask if possible
    d. 2m/6ft exhalation prior to surfacing
    e. Proper recovery breathing

4.14 Graduation Requirements

In order to successfully complete the course students must:

1. Successfully complete all the knowledge development, confined water, and open water training sessions. Open water training is not necessary for Pool Only certification.
2. Demonstrate mature and sound judgment concerning planning and execution.
3. Achieve a passing score of 80% on the final exam and show whole knowledge comprehension.
4. Complete the following skills
    a. Equipment
        i. Prepare equipment with minimal assistance
        ii. Buddy check all equipment
    b. Entry and exit
        i. Enter water with techniques appropriate for the environment
        ii. Signal buddy/shore/boat
        iii. Exit water with techniques appropriate for the environment
    c. Proper weighting and buoyancy
        i. Test for approximate neutral buoyancy at surface by floating upright at collar bone without sculling, finning, or treading.
        ii. After buoyancy has been established – either collarbone for pool only, or 10m/33 ft during open water for Freediver, perform a first level exhalation at the surface - If the student sinks – they are over weighted

d. Snorkel Use
    i. Successfully clear and blast the snorkel without removing the head from the water
e. Proper fin use
    i. Flutter kick at the surface
    ii. Maintain a stationary position with sculling
f. Descent and Ascent Procedures
    i. Surface breathing and preparation
    ii. Remove snorkel prior to entry
    iii. Demonstrate a double leg raised entry or a single leg raised entry in the order of:
        1. Bend
        2. Leg(s)
        3. Pull
        4. Kick
    iv. Demonstrate proper ascent procedures
        1. Head in neutral position
        2. Recapturing expanding air in the mask if possible
        3. Exhale at approximately 2m/7 feet
        4. Proper recovery breathing
    v. During descents and ascents – student head position must remain neutral
g. Self-emergency Ascent Procedures
    i. Flooded mask ascent
        1. Fully flood at depth
            a. Pool only – deep end of pool
            b. Freediver – at 5m/16ft
        2. Remain at depth for approximately 10 seconds before ascending
        3. Ascent and recovery breathe in a controlled manner
    ii. Remove weight belt and ascend
        1. Remove weight belt at depth
            a. Pool only – deep end of pool
            b. Freediver – minimum 5m/16ft
        2. Ascend holding belt low at their side with buckle end down
        3. Perform proper recovery breathing
        4. Replace weight belt at the surface with right hand release

h. Recovery Breathing
    i. Proper exhalation from 2m/6ft
    ii. Position both hands on float/side of pool
    iii. Show proper 3 hook and 3 cleansing breaths on upper half of lung volume
    iv. Hook breaths are held for a full 3 seconds
i. Safety & Problem Management
    i. Assist with recovery breathing as a safety
        1. Be 2 meters/7 feet to 3 meters/10 feet to the side of the freediver
        2. Use audio coaching when necessary
        3. Remain attentive and vigilant for a minimum of 30 seconds after the freediver has surfaced
    ii. Respond to a simulated surface LMC as a Safety
        1. Physically support the freediver
        2. Keep one hand parallel to the water, above the water, but below the chin
        3. Speak calmly to encourage the freediver to breathe
        4. Maintain control until the freediver regains control
    iii. Respond to a simulated blackout at the surface
        1. Place the freediver on their back with the airway protected using a "head sandwich"
        2. Securely support the freediver's head with a "dosey-doe"
        3. Blow, tap, talk 3 times
        4. Maintain control until the freediver regains control
    iv. Assist with a simulated underwater blackout no deeper than 5m/16ft
        1. Recognize signal for assistance
        2. Physically support the freediver
        3. Ensure proper hand placement
        4. Recognize blackout before the surface
        5. Protect the airway with a "head sandwich"
        6. Perform surface blackout procedures through 2 rescue breaths once the student has ascended with the blacked out freediver

Instructors must:

1. Submit certifications to PFI Headquarters within 7 days of course completion date for processing.

5. Intermediate Freediver

5.1 Introduction

This follow-up program to the PFI Freediver course continues to develop the comfort and safety skills of basic level freediving. The PFI Intermediate Freediver is the foundation program for the PFI Advanced Freediver as well as professional programs. It brings a whole knowledge approach introducing skills and techniques as well as a high-level of knowledge in physics, physiology and safety & problem management. During this program participants work in depths as deep as 40m/132ft while learning valuable warm-up skills to enhance this capacity. This program encompasses static apnea and may also introduce dynamic apnea. A PFI Intermediate Pool Only certification may be issued to those not wishing to participate in open water training.

5.2 Course Objectives

This program will also focus on a high level of safety & problem management by learning how to take care of black-outs underwater and initiating BLS recovery procedures while also developing appropriate kick cycles while also developing the sink phase part of negative buoyancy.

5.3 Program Prerequisites

1. Minimum age of 12 for Junior Intermediate Freediver or 16 years for Intermediate Freediver
2. Competent swimming skills
3. PFI Freediver or equivalent skill level

5.4 Required Student Equipment

1. Freediving quality mask, fins and snorkel
2. Freediving quality exposure protection (appropriate for local environment)
3. Freediving quality weight belt and weights (appropriate for local environment)
4. A timing device (preferred freediving computer or gauge)

5.5 Support Materials

Student materials

1. *PFI Medical Statement*
2. *PFI Liability and Assumption of Risk form*
3. *PFI Intermediate* Manual or eLearning

Instructor materials

1. *PFI Intermediate Freediver* Instructor Manual
2. *PFI Intermediate Freediver* Instructor Guide
3. *PFI Intermediate Freediver* final exam and answer sheet

5.6 Qualification of Graduates

1. Upon successful completion of this course, graduates may engage in buddy supported freediving activities appropriate for the environment without direct supervision of an instructor to depths no greater than 40 meters/ 132 ft.
2. Upon successful completion of this course, graduates are qualified to enroll in the Intermediate Freediver Coaching, Advanced Freediver, Open line Diving, Freediver Safety, and Specialty Freediver programs.
3. Divers may be certified with an Intermediate Freediver-Pool Only certification after successfully completing all knowledge Development and Confined Water training sessions. There is no open water training necessary for this level of certification and divers at this level are not certified for any open water activities.

5.7 Who May Teach

This course may be taught by any active PFI Intermediate Freediver Instructor. The PFI Intermediate Freediver Instructor may use active status PFI Assistant Intermediate Instructors to increase student ratios.

To qualify as a PFI Assistant Intermediate Freediver Instructor:

1. Active PFI Freediver Instructor
2. 21 years of age
3. Have certified at least 20 students, 10 of which must be at the Freediver level
4. Fully assist with all components of at least one Intermediate Freediver course with an Intermediate Freediver Instructor.
5. Complete demonstration quality 40m/132 CWT and FIM dives.
6. Be issued the Assistant Intermediate Freediver Instructor Rating from a qualified Intermediate Freediver Instructor.

5.8 Student to Instructor Ratio

Classroom

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

Confined Water

1. A maximum of eight students to one PFI Intermediate Freediver Instructor (8:1). Or a maximum of twelve students to one PFI Intermediate Freediver Instructor (12:1 max) with the use of active status PFI Assistant Intermediate Freediver Instructors

Open Water

1. A maximum of six students to one PFI Intermediate Freediver Instructor (6:1). Or a maximum of ten students to one PFI Intermediate Freediver Instructor (10:1 max) with the use of active status PFI Assistant Intermediate Freediver Instructors

5.9 Depth Restrictions

Open Water

1. Maximum open water depth of 40 meters / 132 ft.

Confined Water

1. Maximum confined water depth of 10 meters / 33 ft

5.10 Recommended Course Minimums

Classroom time

1. 12.0 Hours

Confined Water time

1. 5.0 Hours

Open Water time

1. 7.5 Hours

5.11 Knowledge Development Overview

The following topics must be covered during this course by the PFI Intermediate Freediver

Instructor and/or active status PFI Assistant Intermediate Freediver Instructor as outlined in the PFI General Standards and Procedures section. Instructors may use additional texts or materials they feel help present these topics.

1. Introduction
    a. Participant and staff introductions
    b. Course overview
    c. Paperwork and prerequisites
    d. Equipment requirements check
    e. Classroom, confined and open water protocols and conduct
    f. Safety / supervision practices
2. History of Freediving
    a. Origin of freediving
        i. Roman and Greek armies
        ii. Ama Freedivers
        iii. Modern day freediving
3. Safety & Problem Management
    a. Freediving supervision
        i. Supervision
        ii. Proximity
        iii. Technique
    b. Safety for depth freediving
        i. Styles of depth freediving
        ii. Constant ballast
        iii. constant ballast no-fins
        iv. Free immersion
        v. Rule of 9's
        vi. Positioning and proximity
            1. Safety depth - meet at 1/3 Freediver's max depth
                a. Safety time - intercepts Freediver 10sec after reaching safety depth (dive time +10sec)
        vii. 2, 3 and 4 person teams

c. Safety and signals for static apnea
    i. What is static apnea
    ii. Why train in static apnea
    iii. Signals
    iv. Two strikes rule
    v. Target times
    vi. Exiting a static apnea
    vii. Responding to emergencies
d. Safety for dynamic
    i. What is dynamic apnea
    ii. Why train in dynamic apnea
    iii. Safety positioning
    iv. Responding to emergencies
e. Performance evaluations
    i. Determine next target time, depth and distance
    ii. The 10 evaluation criteria
        1. Tired/exhaustion
        2. Technique
        3. Equalizations
        4. Near-blackout/blackout
        5. Urge to breath/contractions
        6. Pressure contractions
        7. Tired legs/failure
        8. Equipment performance
        9. Chest compression/squeeze
        10. Narcosis
f. Self-bailout underwater
    i. Steps of self bailout:
        1. Terminate the Freedive
        2. Use line for assistance
        3. Signal buddy for help
        4. Release weight belt and hold in hand for future release
        5. Drop weight belt
        6. Keep eyes open
        7. Discontinue freediving day with any signs of hypoxia
        8. Moderate freediving time, depth, distance, exertion

g. Assisted bailout underwater
    i. Bailout signal
        1. Hand signal and/or head signal
        2. Started before reaching safety at depth
    ii. Line signals
        1. Safety lightly holds line and feels for pulls
    iii. Provide support and propulsion
    iv. Under arm, waist or hands
    v. Utilize ascent line for propulsion assistance if possible
    vi. Monitor airway for LMC/BO
    vii. Ditch weight belt if required
h. Protective breathing reflexes
    i. Cessation of breathing
    ii. Restart breathing response with blow tap talk
    iii. Laryngospasms
i. Freediver rescue breathing (FRB)
    i. Create airway by 'dosey doe' position and head tilt
    ii. Remove mask
    iii. Three blow-tap-talks (BTT)
    iv. Call for assistance
    v. Rescue breaths
j. Near-blackouts (LMC)
    i. Near Blackout/LMC/Samba
    ii. Signs and Symptoms of near blackout / LMC
    iii. Assisting an LMC underwater
    iv. Assisting an LMC at the surface
k. Blackouts (BO)
    i. Depth vs. Apnea Hypoxia
    ii. Signs and symptoms of Blackouts / BO
    iii. Assisting Blackouts at the surface
    iv. Assisting blackouts underwater
l. Buddy separation
    i. Surface
    ii. Underwater
        1. Search patterns
            a. U patterns
            b. Expanding square

4. Equipment for Intermediate Freediving
    a. Masks
        i. Types
        ii. Features and materials
        iii. Proper maintenance
    b. Fins
        i. Mono-fins vs long fins
        ii. Benefits of long blade fins
        iii. Blade materials
        iv. Full foot vs. open heel foot pockets
        v. How to properly fit a fin
        vi. Proper maintenance
    c. Snorkels
        i. Features of a good freediving snorkel
        ii. Placement of snorkel on mask strap
        iii. Use
        iv. Proper maintenance
    d. Exposure protection
        i. Wetsuits
            1. Types
            2. Features and materials
        ii. Hoods
            1. Types
            2. Features and materials
        iii. Gloves
            1. Types
            2. Features and materials
        iv. Socks
            1. Types
            2. Features and materials
    e. Freediving computers
        i. Freediving computer vs timers
            1. Types
            2. Features
            3. Care and maintenance

   f. Weight systems
      i. Types of weight systems
      ii. Rubber vs. nylon belts
      iii. Weights
      iv. Proper placement of belt
      v. Buckles
      vi. Accessories and maintenance
   g. Lines, flags and floats
      i. "Diver Below Flag"
      ii. Alpha Flag
      iii. Floats
   h. Accessory freediving equipment
      i. Nose clips & fluid goggles
      ii. Gear bags
      iii. Freediving knives
      iv. Lights and markers
      v. Goodie bags and stringers
5. In-Water Environment
   a. Local aquatic animal and plant life
   b. Hazardous animals and plants
   c. Animals/plants of interest
   d. Local environmental conditions
      i. Fresh vs salt
      ii. Temperature and thermoclines
      iii. Visibility
      iv. Wind, waves and currents
      v. How to asses and plan accordingly
      vi. Sea sickness medications
   e. Local freediving procedures
   f. Entry/exit procedures
6. Freediving Breathing Techniques
   a. Respiratory muscles / breathing segments
      i. Diaphragm
      ii. Intercostal
      iii. Scalene/subclavian
      iv. Neck
   b. Breathing techniques
      i. Normal ventilations
      ii. Ventilations
      iii. Purging
      iv. Peak Inhalation

c. Specialty breathing techniques
    i. Packing
    ii. Reverse packing
d. Recovery breathing
    i. Hook breaths
    ii. Cleanse breaths
    iii. Pool - static/dynamic recovery breaths
    iv. Ocean – depth/constant ballast/free immersion recovery breaths
    v. Safety Procedures
e. Breathing exercises
    i. Segmented breathing
    ii. Negative diaphragm
    iii. Packing stretches
    iv. Reverse packing

7. Equalization Techniques – body
    a. Equalizing ears, sinuses and mask
    b. Methods of equalizing
        i. Frequency
    c. Equalizing Issues
    d. Masks
8. Physics of Freediving
    a. Depth and pressure
        i. Biggest change on our physiology
        ii. Weight 100km / 62miles of atmosphere = 14.7psi/1 bar/ 1ata at sea level
        iii. Every 10m/33ft of sea water is the equivalent of 1ata
    b. Pressure and volume
        i. Boyles Law
        ii. 5 airspaces affected by Boyle's law
            1. Lungs, ears, sinuses, mask, wetsuit
            2. Lung compression vs importance of small mask volumes
            3. Not losing air during descents due to equalizing
            4. Re-inhale mask air volume during ascent
    c. Partial pressures
        i. Daltons law of pressures
        ii. Effects of varying partial pressures of O2 during a Freedive

   d. Buoyancy principles
      i. Archimedes' principle
      ii. Three states of buoyancy
      iii. Effects of buoyancy
      iv. Descents and ascent techniques
   e. Streamlining and hydrodynamics
      i. Density of water versus air
      ii. Drag and hydrodynamics
9. Physiology of Freediving
   a. Nervous system
      i. Central nervous system
         1. Peripheral nervous system
         2. Sympathetic/Parasympathetic nervous system
   b. Circulatory system
      i. Purpose
      ii. Functions
      iii. Differences between sexes
      iv. Relation to freediving
   c. Respiratory system
      i. Purpose
      ii. Functions
      iii. Differences between sexes
      iv. Relation to freediving
   d. Lung volumes and freediving
      i. Pulmonary function test
      ii. Main lung volume measurements:
         1. Inspiratory volume (IV)
         2. Expiratory volume (EV)
         3. Vital capacity (VC)
         4. Functional residual capacity (FRC = EV + RV)
         5. Packing volume (PV)
   e. What makes us breathe
      i. Reflex respiratory center (RRC)
      ii. Chemoreceptors
      iii. Stretch receptors

f. Types of blackout
    i. 3 freediving blackouts
        1. Static blackout
        2. Ascent blackout
    ii. Whiteout
    iii. Excessive hyperventilation
    iv. Excessive lung expansion
    v. CO2/N2 blackouts
    vi. Barotrauma blackouts
g. Aquatic adaptations
    i. Mammalian diving reflex
    ii. Four main adaptations:
    iii. Blood shunting or blood prioritization
        1. Effects of immersion
h. Pressure and body airspaces
    i. Airspaces in the body
        1. Elastic
        2. Rigid
        3. Semi-rigid
    ii. Intestinal squeeze
i. Barotraumas – pressure related injuries
    i. Middle ear
    ii. Barotitis media
        1. Alternobaric vertigo
    iii. Transient vertigo
    iv. Mask squeeze
j. Physiological stresses and dangers
    i. Hypoxia
    ii. Hypercapnia
    iii. Hypocapnia
    iv. Decompression sickness

10. Psychology of Freediving
    a. Anxiety Stimulus
        i. Physiology of stress
        ii. Causes
            1. Physical Stress
            2. Physiological Stress
            3. Psychological Stress

iii. Stress Reduction
    1. Stop – Think – Act
    2. Employ Psychological techniques
iv. Self-talk
v. Step by step
vi. Compensatory changes
vii. Visualization

11. Training Programs for Freediving
    a. In-Water Training Exercises
        i. Confined Water Skills & Techniques
        ii. Open Water Skills & Techniques
        iii. Communications

5.12 Confined Water

The following confined water skills are to be briefed, demonstrated, evaluated, practiced and debriefed by the PFI Intermediate Freediver Instructor and/or certified active PFI Assistant Intermediate Freediver Instructor as outlined in the PFI General Standards and Procedures section.

- During all skills students will act in a buddy team: surface safety and breath holder.

To be certified as a PFI Intermediate Freediver a student must demonstrate the following skills to the satisfaction of the PFI Instructor as follows:

1. Watermanship and Stamina (May be completed in open water. If done in open water, must be completed prior to any other open water skills)
    a. Distance swim of 200 metres non-stop using any stroke without the use of swimming aids (mask or swim goggles may be used), **or** 300 metres nonstop using mask, snorkel, and fins
    b. Tread water for 10 minutes without floatation

Note: If an exposure suit is worn for any of the above skills, the wearer must be neutrally buoyant at the surface.

2. Snorkel Breathing
    a. Swim continuously at the surface without a mask for a minimum of 25m/82ft without removing face from the water while breathing continuously through the snorkel

3. Open Water Freedive Simulation
    a. Breathe up
    b. Remove snorkel
    c. Descent with proper head position
    d. Appropriate kick cycles to simulate freediving to 20 metres / 66 feet plus 10 seconds relaxed kicking against the bottom
    e. Ascent with proper head position
    f. Drop arms at 10m (simulated depth) and shallower
4. Static and Dynamic Apnea
    a. Static apnea
        i. As a breath-holder student must complete a minimum of 4 consecutive static breath-holds
            1. 1st session vent – hold – purge ratios:
                a. 2min – 1min – no purging
                b. 3min – 2min – purges start at approximately 0:30
                c. 4min – 3min – purges start at approximately 0:45
                d. d. 5min – 4min – purges start at approximately 1:00
            2. 2nd optional static session vent – hold – purge ratios:
                a. 3min – 2min – no purging
                b. 4min – 3min – purges start at approximately 0:30
                c. 5min – 4min or unlimited – purges start approximately between 1:15
        ii. Complete a minimum 3:00 static apnea without any hypoxic signs or symptoms
        iii. As a safety, student must complete:
            1. Buddy supervision
            2. Monitor timing
            3. Perform safety signals
            4. Recovery breathing and support assistance
5. Dynamic apnea (optional)
    a. As a breath-holder student must complete a minimum of 3 dynamic performances
        i. Vent – distance ratio:
            1. 1min – 25m
            2. 2min – 25m + turn
            3. 2min – 50m
    b. Streamlining and kicks appropriate for dynamic
    c. Complete a minimum 50m dynamic apnea without any hypoxic symptoms

   d. As a safety student must complete:
      i. Surface safety with floatation
      ii. Recovery breathing and surface support assistance
6. Negative Pressure Dives
   a. Students work as Buddy A and Buddy B; switching back and forth after each dive
   b. Students must complete a maximum of 6 negative pressure dives
      i. 1 – 2; first level exhalation; mouth fill and Frenzel mouth fill out of mask through nose
      ii. 3 – 4; second level exhalation; focus on head position, practice mouth fills on bottom
      iii. 5 – 6; third level exhalation with mouth fill; focus on head position, relaxation and air management
   c. Complete at minimum, first level exhalation with proper equalization at minimum depth of 3m/10ft, or second level exhalation with proper equalization for pools shallower than 3m/10ft
   d. Complete all dives as follows:
      i. Employ surface pre-equalizations; ½ way down and once on bottom
      ii. Hand over head for protection holding mask in place
      iii. Head down vertical position during sink and while on bottom (exception dive #6 where students may take heart rate relaxed on bottom)
      iv. Preform recovery breathing
   e. As Safety provide supervision and assistance with recovery breathing.

5.13 Open Water

The following open water skills are to be briefed, may be demonstrated if a newly introduced skill, evaluated, practiced and debriefed by the PFI Intermediate Freediver Instructor and/or certified active PFI Assistant Intermediate Freediver Instructor as outlined in the General Standards and Procedures section.

- During all skills students will act in a buddy team: surface safety and breath holder.

To be certified as a PFI Intermediate Freediver a student must demonstrate the following skills to the satisfaction of the PFI Instructor as follows:

1. Open Water Training Sessions
    a. A minimum of two (2) separate ocean sessions must be completed with three (3) recommended
2. Weighting and Buoyancy
    a. Establish positive buoyancy at approximately 5m/16ft after a 1st level exhalation without sculling, finning, treading, or pushing off plate.
    b. Establish neutral buoyancy at approximately 10m/33ft without sculling, finning, treading, or pushing off plate.
3. Fin Use
    a. Demonstrate proper kick cycles determinations to landmark depths:
        i. Landmark 10m/33ft kick cycles count
        ii. Landmark 15m/50ft kick cycles count
        iii. Landmark 20m/66ft kick cycles count
        iv. Landmark 25m/82ft kick cycles count
4. Free Immersion Warm-up Dives
    a. Eight free immersion warm-up dives
    b. Complete a minimum of eight (8) free immersion style freedives as a warm-up
    c. Must reach a minimum of 25m / 82ft without any hypoxic symptoms or barotraumas
    d. Employing the following proper techniques described below:
        i. Breathe up properly.
        ii. Remove snorkel
        iii. Descend using double or single leg descents.
        iv. Ensure proper head position.
    e. Facial immersion for 5min may be introduced on open water session 2
    f. A negative pressure dive with 1st level exhalation to a max 10m/33ft with 'touch 'n go' may be introduced as last warm-up procedure on open water session 2
5. Constant Ballast Target Dives
    a. Complete a minimum of eight (8) constant ballast style freedives
    b. Reach a minimum depth of 25m / 82ft without hypoxic symptoms or barotraumas

c. Employ the following proper techniques described below:
    i. Surface breathing and preparation
    ii. Remove snorkel
    iii. Single leg raised descent
    iv. Proper head position
    v. Proper kick cycles to 20 metres / 66 feet
d. Pause kicking and sink to target depth with intermittent maintenance kicks to keep descent rate.

6. Emergency Rescue & Problem Management
    a. Assist with a simulated surface LMC as a safety for a simulated 25m dive
        i. Meet freediver at proper safety depth of 10m.
        ii. Signal and respond to freediver's signs and issues.
        iii. Physically support the freediver.
        iv. Keep one hand on the chest above the waterline but below the chin.
        v. Speak calmly to encourage the freediver to breathe.
    b. Respond to a simulated blackout at the surface for a simulated 30m dive.
        i. Meet freediver at proper safety depth of 10m
        ii. Signal and respond to freediver's signs and issues
        iii. Protect the freediver's airway with a "head sandwich"
        iv. Place the freediver on their back into a "dosey-doe"
        v. Remove mask
        vi. Blow, Tap, Talk 3 times.
    c. Assist with a simulated underwater blackout for a simulated 40m dive
        i. Meet freediver at proper safety depth of 15m.
        ii. Signal and respond to freediver's signs and issues.
        iii. When freediver blacks out, protect airway with a "head sandwich"
        iv. Swim freediver to the surface and place on back and into "dosey-doe" position
        v. Remove mask and perform Blow, Tap, Talk 3 times
        vi. Perform 2 simulated rescue breaths and call for assistance
        vii. Begin to evacuate while performing simulated rescue breaths once every 5 seconds.

5.14 Graduation Requirements

In order to successfully complete the course students must:

1. Successfully complete all the knowledge development, confined water, and open water training sessions. Open water training is not necessary for Pool Only certification.
2. Demonstrate mature and sound judgment concerning planning and execution.
3. Achieve a passing score of 80% on the final exam and show 100% knowledge comprehension
4. Complete the following skills
    a. Equipment
        i. Prepare equipment with minimal assistance
        ii. Buddy check all equipment
    b. Entry and exit
        i. Enter water with techniques appropriate for the environment
        ii. Signal buddy/shore/boat
        iii. Exit water with techniques appropriate for the environment
    c. Proper weighting and buoyancy
        i. Test for approximate neutral buoyancy at surface by floating upright at collar bone without sculling, finning, or treading.
        ii. After buoyancy has been established – either collarbone for pool only, or 10m/33 ft during open water for Intermediate Freediver, perform a first level exhalation at the surface - If the student sinks – they are over weighted
    d. Snorkel Use
        i. Successfully clear and blast the snorkel without removing the head from the water
    e. Proper fin use
        i. Flutter kick at the surface
        ii. Maintain a stationary position with sculling
    f. Descent and Ascent Procedures
        i. Surface breathing and preparation
        ii. Remove snorkel prior to entry
        iii. Demonstrate a double leg raised entry or a single leg raised entry in the order of:
            1. Bend
            2. Leg(s)
            3. Pull
            4. Kick

iv. Demonstrate proper ascent procedures
    1. Head in neutral position
    2. Recapturing expanding air in the mask if possible
    3. Exhale at approximately 2m/7 feet
    4. Proper recovery breathing
v. During descents and ascents – student head position must remain neutral

g. Self-emergency Ascent Procedures
    i. Flooded mask ascent
        1. Fully flood at depth
            a. Pool only – deep end of pool
            b. Intermediate Freediver – at 10m/33ft
        2. Remain at depth for approximately 10 seconds before ascending
        3. Ascent and recovery breathe in a controlled manner
    ii. Remove weight belt and ascend
        1. Remove weight belt at depth
            a. Pool only – deep end of pool
            b. Intermediate Freediver – minimum 10m/33ft
        2. Ascend holding belt low at their side with buckle end down
        3. Perform proper recovery breathing
        4. Replace weight belt at the surface with right hand release

h. Recovery Breathing
    i. Proper exhalation from 2m/6ft
    ii. Position both hands on float/side of pool
    iii. Show proper 3 hook and 3 cleansing breaths on upper half of lung volume
    iv. Hook breaths are held for a full 3 seconds

i. Safety & Problem Management
    i. Assist with recovery breathing as a safety
        1. Be 2 meters/7 feet to 3 meters/10 feet to the side of the freediver
        2. Use audio coaching when necessary
        3. Remain attentive and vigilant for a minimum of 30 seconds after the freediver has surfaced
    ii. Respond to a simulated surface LMC as a Safety
        1. Physically support the freediver
        2. Keep one hand parallel to the water, above the water, but below the chin
        3. Speak calmly to encourage the freediver to breathe
        4. Maintain control until the freediver regains control

iii. Respond to a simulated blackout at the surface
    1. Place the freediver on their back with the airway protected using a "head sandwich"
    2. Securely support the freediver's head with a "dosey-doe"
    3. Blow, tap, talk 3 times
    4. Maintain control until the freediver regains control
iv. Assist with a simulated underwater blackout
    1. Recognize signal for assistance
    2. Physically support the freediver
    3. Ensure proper hand placement
    4. Recognize blackout before the surface
    5. Protect the airway with a "head sandwich"
    6. Perform surface blackout procedures through 2 rescue breaths once the student has ascended with the blacked out freediver
v. Lost Freediver – completed no deeper than 10m/33ft
    1. Surface swim minimum 25m/82ft looking for "lost" freediver
    2. Locate freediver, catch breath, breathe up
    3. Make proper entry and simulate 25m/82ft dive
    4. "Victim" descends after rescuer has been under water for approximately 20 seconds and will lay on the bottom next to the "rescuer"
    5. After completion of 25m/82ft descent simulation, rescuer secures victim's airway with a "head sandwich"
    6. Ascend to the surface and place victim into "dosey-doe" and perform surface blackout rescue procedures
    7. Call for assistance and evacuate the victim 50m/165ft while simulating rescue breaths every 5 seconds

Instructors must:

1. Submit certifications to PFI Headquarters within 7 days of course completion date for processing.

6. Open Line Diving

6.1 Introduction

This program is designed to provide open line diving for PFI or equivalent certified Freedivers at the Snorkeler, Freediver, Intermediate, Advanced, or Specialty Freedive areas with the opportunity for supervised buddy diving sessions in pool or depth disciplines. These sessions will provide a diving support system which may include counter-balances or similar FRS under the supervision of a trained PFI Professional.

6.2 Course Objectives

The objective of these open line diving sessions is to provide individuals a training environment that allows them to practice diving and skills with a buddy. Freedivers are limited to the maximum depths for which they are certified with the proper safety protocols in place. Specialty Freediver areas governed by limits of that particular specialty or their primary certification.

6.3 Program Prerequisites

1. Minimum age of 18 years (10 with written consent of legal guardian)
2. Certified as a PFI Snorkeler, PFI Freediver, PFI Intermediate Freediver, PFI Advanced Freediver or equivalent skill level if defined
3. For 'Open Line Diving' Freedivers must have finished a PFI course, refresher, or coaching session in the last 6 months and provided proof of such experience to the satisfaction of the PFI Supervisor
4. Qualified Freedivers may participate in Open Line diving outside of the 6-month limitation if they have continually participated in Open Line Diving sessions and have proof in the form of a Freediving Record Card
5. A PFI Freediver Supervisor may at any time require that a Qualified Freediver take a Coaching Session or Refresher if necessary before participating in Open Line Diving

6.4 Required Student Equipment

1. Freediving quality mask / fins / snorkel, wetsuits, weights and belt, Freediving computer or timing device, line cutter/knife (as required by the local environment) or any specialty equipment deemed necessary by the local environment of specifics of the training session such as lanyards.

6.5 Support Materials

Student materials

1. *PFI Liability and Assumption of Risk form*
2. *PFI Medical Statement*

Supervisor materials and systems

1. PFI approved Freediver Support / Retrieval Systems (FRS)
2. BLS / First Aid support equipment

6.6 Qualification of Graduates

1. Upon successful completion of this open line diving session the Freediver receives no certification.
2. Upon successful completion of this open line diving, graduates receive no pre-qualification to enroll in any PFI courses, except those that may require proof of Freediving experience with a PFI Freediver Supervisor within the last 12 months.
3. Upon successful completion of this open line diving session the Freediver may request a signature on their Freediving Record card as proof of recent diving experience.

6.7 Who May Teach

This open line diving session may be conducted by any active status PFI Freediver Supervisor.

6.8 Student to Instructor Ratio

Classroom / Briefing

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

Confined Water

1. Maximum of twelve students to one PFI Freediver Supervisor (12:1).

Open Water

1. Maximum of 6 students to one PFI Freediver Supervisor (6:1).

6.9 Depth Restrictions

Confined Water

1. Maximum confined water depth limited to experience and qualifications

Open Water

1. Maximum open water depth limited to experience and qualifications.

6.10 Recommended Course Minimums

Classroom

1. 0.5 Hours

Confined Water

1. 2.0 Hours

Open Water

1. 2.0 Hours

6.11 Knowledge/Briefing Overview

The following topics must be briefed during the training session. Instructors may use additional texts or any other materials to present these topics.

1. Introduction:
    a. Open Line Diving Overview
    b. Paperwork and Prerequisites
    c. Equipment Requirements Check
    d. Boat / Pool Protocols and Conduct
    e. In-water Protocols and Conduct
    f. Safety / Supervision Practices
2. Open Line Diving Session Overview:
    a. Welcome
    b. What an open line diving session is and isn't
        i. Opportunity to practices your skills and abilities
        ii. Support rig provided
        iii. Training not coaching - There will be no instructor supervising directly
        iv. Not a means of getting greater depths beyond certification level

   c. Responsibilities
      i. Conduct yourself in a safe and responsible manner as outlined by your training level
      ii. Provide back-up safety according to your level if a situation or accident would require
3. Paperwork and Prerequisites:
   a. Participant Information Form
   b. Liability
   c. Medical forms
   d. Standard Safe Freediving Practice Statement of Understanding
   e. Verify certification as PFI Snorkeler through Advanced Freediver or specialty Freediver programs or equivalent
4. Equipment Requirements Check:
   a. Appropriate Freediving mask, fins, snorkel
   b. Appropriate exposure protection for local environment
   c. Appropriate weights and weight belt
   d. Appropriate Freediving computer or timing device
   e. Appropriate knife or line cutting device for local environment if required
   f. Lanyards if required by depth and level of certification
5. Boat / Pool Protocols and Conduct:
   a. Boat / Pool important areas
   b. Suiting up / down and gear storage
   c. Entries and exits
   d. In-water communication with boat / pool staff
   e. Drifting procedures
6. In-water Protocols and Conduct:
   a. Swimming to and from support station
   b. Rig set-up and breakdown
   c. Rig rules
   d. Freediving rotations
7. Safety / Supervision Practices:
   a. Direct Supervision Protocols
   b. Proper Buoyancy
      i. Neutral Buoyancy at no less than 10m / 33ft
      ii. At a minimum, positive on the surface with exhalation
   c. Counter-balance and plate depth adjustments

d. Line rotations for supervision:
    i. 2-person alternating, break between performing and safety
    ii. 3-person alternating, safety after performing
    iii. 4-person, buddy team rotation
    iv. 5-person, alternating with break before safety
    v. 6-person, buddy team rotation
e. LMC / BO Procedures Review
    i. Surface LMC protocols
    ii. Surface BO protocols
    iii. Depth bail-out
    iv. Underwater blackout protocols
    v. No Freediving after LMC/BO
    vi. BLS protocols & calling for help

6.12 Graduation Requirements

In order to successfully complete an open line diving session Freedivers must:

1. Attend all knowledge / briefing sessions and confined water or open water training sessions
2. Demonstrate proficiency in in-water buddy diving technique
3. Demonstrate mature and sound judgment concerning planning and execution.

PFI Freediver Supervisors or higher professional members must:

1. Keep all paperwork on file for no less than 7 years.

7. Safety Freediver

7.1 Introduction

The PFI Safety Freediver course is a recreational level program where successful participants will learn the knowledge, skills and techniques for advanced level safety that may be used in demanding freediving environments, Advanced level depths of freediving, and competition style freediving for depths beyond 40m/132ft.

7.2 Course Objectives

The objective of this course is to train individuals in the benefits, skills, techniques and safety & problem management for advanced level and competition style safety. Safety Freediver focuses on safety and problem management as well as risk mitigation with an emphasis on counter-balance set-up and use. It also incorporates primary and secondary safety freedivers for accident management.

7.3 Program Prerequisites

1. 16 years of age
2. Above average swimming skills
3. PFI Intermediate Freediver, or equivalent from another recognized agency that have also completed the PFI Intermediate Freediver Crossover Exam
4. Be an active status CPR, first aid and AED provider with a program that include marine life injuries and neurological assessments*
5. Be certified to administer O2 for dive related injuries*

   * These programs can be taught concurrently with Safety Freediver.

7.4 Required Student Equipment

1. Freediving quality mask, fins, snorkel
2. Freediving quality exposure protection (appropriate for local environment)
3. Freediving quality waist and neck weight belt and weights (appropriate for local environment)
4. Freediving computer and additional timing device

7.5 Support Materials

Student materials:

1. *PFI Medical* Statement
2. *PFI Liability and Assumption of Risk* form
3. *PFI Safety Freediver* Slides

Instructor materials:

1. *PFI Safety Freediver* Presentation
2. PFI Safety Freediver final exam and answer sheet
3. AIDA sanctioned freediving lanyard

7.6 Qualification of Graduates

1. Upon successful completion of this course, graduates may engage in safety freediving activities as a safety during advanced level training for depths up to and exceeding 60m/197ft.
2. Students will be able to perform each position of a freedive safety team.
3. Upon successful completion of this course, graduates are qualified to enroll in Advanced Freediver, Freediver Supervisor, Open-line Diving, and Specialty Freediver programs.
4. Divers may be certified with a Safety Freediver-Pool Only certification after successfully completing all knowledge Development and Confined Water training sessions. There is no open water training necessary for this level of certification and divers at this level are not certified for any open water activities.

7.7 Who May Teach

This course may be taught by any active PFI Intermediate Freediver Instructor. The PFI Intermediate Freediver Instructor may use active PFI Assistant Intermediate Freediver Instructors to increase student ratios.

7.8 Student to Instructor Ratio

Classroom

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

Confined Water

1. A maximum of eight students to one PFI Intermediate Freediver Instructor (8:1). Or a maximum of twelve students to one PFI Intermediate Freediver Instructor (12:1 max) with the use of active status PFI Assistant Intermediate Freediver Instructors

Open Water

1. A maximum of six students to one PFI Intermediate Freediver Instructor (6:1). Or a maximum of ten students to one PFI Intermediate Freediver Instructor (10:1 max) with the use of active status PFI Assistant Intermediate Freediver Instructors

7.9 Depth Restrictions

Open Water

1. Maximum open water depth of 40 meters/132 feet.

Confined Water

1. Maximum confined water depth of 10 meters/33 feet

7.10 Recommended Course Minimums:

Classroom time

1. 4.0 hours

Confined Water time

1. 5.0 hours

Open Water Time

1. 6.0 hours

7.11 Knowledge Development Overview

The following topics must be covered during the course. Instructors may use additional texts or materials they feel help present these topics

1. Introduction
    a. Participant and staff Introductions
    b. Course overview
    c. Paperwork and prerequisites
    d. Equipment requirements check
    e. Classroom, confined and open water protocols and conduct
    f. Safety / supervision practices
2. Roles as Safety Freediver
    a. Safety Freediver Responsibilities:
        i. Role model
        ii. Directly responsible for the safety of the performing freediver
        iii. Areas of responsibility: comp line, warm-up lines, transition zones, spectator area
        iv. Safety team: primary, secondary, on deck, clutch, timer, first aid
        v. First aid and freediver retrieval systems setup
    b. Safety Freediver in Training
        i. Training is any individual or group meeting to work on techniques and achieve greater depths within their certification levels outside of formal training under the supervision of a PFI Professional Member.
        ii. Assist with the group in setting up the training area whether confined or open water
        iii. Set up safety equipment including first aid, emergency oxygen, in-water freediving recovery oxygen, and the open water freediver retrieval system.
        iv. Note that a Safety Freediver is an advanced safety that is trained to handle many situations – however not eligible for liability insurance and cannot be part of any organized event, or educational program
3. Advanced Safety & Problem Management
    a. Advanced Depth Safety Protocols, Systems and Teams:
        i. These recommendations are for training dives outside of class or competitions
        ii. All competition dives require a lanyard and FRS regardless of depth
        iii. 0-20m: 2-person freedive team. At depth safety may be required.
        iv. 21-40m: 3-person freedive team recommended and at depth safety.
        v. 41m – 60m: 4-person freedive team, two at depth safety, 'Freediver Retrieval System' (FRS) and lanyards mandatory

vi. 61m – 80m: 5-person freedive team, three at depth safety, counterbalance and lanyards mandatory
vii. 81m+: 6 person+ freedive team, multiple at depth which may include scuba support, counterbalance and lanyards mandatory

b. Individual Team Member Roles:
   i. Individual team roles provide the following:
      1. Appropriate level of safety for the performance
      2. Back-up / redundancy
      3. Emergency signals for depth to surface
      4. Efficient activation and use of counterbalances
      5. Adequate rest periods for team members
      6. Each role may have dual purposes
         a. Primary Safety Freediver
            i. 1/3 Depth and dive time + 10 seconds
            ii. Responds to and signals emergency / bailout
            iii. Protects airway
            iv. Provides BLS until requests change
            v. May request position change at depth
         b. Secondary Safety Freediver
            i. 5m/16' shallower and 10 seconds later than Primary
            ii. May provide downtime count
            iii. Provides support and propulsion
            iv. Removes lanyard at surface
            v. Provides surface propulsion, support, and BLS if requested
            vi. May take primary position at depth if signaled
            vii. Responds to and signals emergency / bailout
         c. Scooter Safety Freediver
            i. 2/3 depth + 10 seconds
            ii. Responds to and signals emergency / bailout
            iii. Provides support and propulsion
            iv. Responds to performer
            v. Slows or hands off to primary and secondary at shallower depths
            vi. Safety Freedivers using scooters should be PFI DPV Freediver certified

d. On-Deck / Primary stand-by
    i. Rotates into primary position next
    ii. May provide countdown & downtime
    iii. May work clutches and counterbalance
    iv. May take secondary position if primary surfaces
    v. Responds to and signals emergency / bailout
e. On-Deck / Secondary stand-by
    i. Rotates into secondary position next
    ii. May provide countdown & downtime
    iii. May work clutches and counterbalance
    iv. Responds to and signals emergency / bailout
f. Scuba Safety
    i. Used to provide 'eyes on' and immediate emergency signal to surface at depths below 80m
    ii. Responds to and signals emergency / bailout
    iii. May also have an FRS (lift bag and bottle w/ carabiner or line ascender)
        1. Scuba Safety Divers need to be trained and qualified to the depth they are performing as safety and additionally need to be trained and certified as TDI Scuba Freedive Safety
g. Clutch (person responsible at surface for the counter-balance operations)
    i. Responds to and signals emergency / bailout
    ii. Works the clutch/cleat and/or drop-weight
    iii. Provides additional 'pulling power'
    iv. May also support performer during surface breath-up
    v. May also provide count-down and count-up

c. Line Freediving Operating Procedures:
    i. Pre-Dive:
        1. Agree on objectives for the day; team, locations, depths, equipment
        2. Develop 'Emergency Assistance Plan'
        3. Assemble and assign team and performer rotations along with personal equip check
        4. Prep and check rig and safety / first aid equipment
        5. Review safety procedures and provide 'dry-runs'
        6. Set-up equipment at training site and do rig / safety equipment check

ii. Dive:
1. Confirm performer, style, depth, anticipated time and countdown time
2. Establish rotations and jobs
3. Dive check between primary/secondary:
4. Initiate count-down and count-up
   a. Count-down; 2min standard count-down till performer dives
   b. Count-up; after performer starts in +10sec
5. Safety freedive team performs according to training and protocol:
   a. Good performance; conduct performer post-dive evaluation
   b. Performer requests bailout; conduct performer post-dive performance evaluation
   c. Performer requires emergency bail-out (LMC, BO):
      i. Initiate emergency response u/w
      ii. Initiate any surface emergency response
6. Surface safety check to check all team members are OK and move to 2nd performer starting back at the top 'Confirm performer, style, depth, anticipated time and countdown time'

iii. Post-Dive:

d. Breakdown, rinse and store rig and safety equipment checking for damage
e. Debrief the team training session; objectives for the day, team, locations, depths, equipment, performances, and any rescues

4. Counterbalance & Freediver Retrieval Systems:
   a. History and concepts of freediver retrieval systems and counterbalances
      i. Freediver Retrieval System (FRS) is any system that allows the performing freediver to be independently and immediately retrieved from depth while wearing a lanyard, from max depth to the surface with minimal effort and at a speed equal to or greater than the freediver would typically swim (1m/s)
      ii. FRS' should have two systems; primary FRS and back-up

iii. FRS's included:
1. Counterbalances
2. Float and line pulled from surface by surface tenders or mechanical engines
3. Scuba divers with lift-bags
4. Other systems may exist that follow the criteria set above

iv. Counter-balance concept
1. Retrieve a freediver from depth when lanyard is used
2. Safety activated from the surface
3. Safeties at depth can signal surface to activate system
4. Balanced or over-balanced

v. Counter-balance parts and pieces
1. PVC, aluminum, carbon fiber bars just below surface keep floats and lines apart
2. Floats – at end of each bar
3. Lines
4. Bottom weights
5. Bottom plate
6. Configurations
7. Use and operation of counterbalance

b. Lanyards parts, pieces and use
i. Wrist / waist / ankle strap, line or cable, quick release with D-ring and carabiner
ii. Waist belt is separate of the weight belt
iii. Cable is typically 1m (shorter or longer)
iv. Carbineer; aluminum and composite will follow, stainless steel leads during sink phase
v. AIDA rules govern lanyard specifications for competitions

5. Emergency Signals:
a. Surface to Shore/Boat
i. Hand Signals
ii. Sound Signal :

b. U/W Diver to Diver or surface
i. Hand Signals
ii. Sound Signal:

6. Advance Weighting Precautions:
    a. Advanced freedivers may be neutrally buoyant at 15m/50' or deeper on a peak inhalation plus packing
    b. Due to packing, the freediver may be negatively buoyant at the surface on an exhalation
    c. This is one reason we use freediver recovery systems with lanyards
    d. Since freedivers will be warming up while weighted for their dive, extra supervision must always be maintained, including use of a lanyard
7. Common Freediver Problems and Responses
    a. Post-Freedive Performance Evaluation Criteria or Bailout:
        i. Oxygen, energy, equalizing, legs, urge to breathe, psychology, equipment, chest compression, technique, own it
    b. Common Physiological Problems:
        i. Stress and anxiety, hypoxia, LMC, recovery breathing, 6 types of blackout, CO2 accumulation
    c. Recovery Breathing Problems:
        i. Improper volume
        ii. No hook breaths from depth
        iii. Not holding hook breaths long enough
        iv. Not enough breaths
    d. Common Equipment Problems:
        i. Masks & Facial Equipment
        ii. Snorkel
        iii. Fins
        iv. Wetsuits & Exposure Protection
        v. Weight Systems
        vi. Computers
        vii. Lanyards:
            1. Wrist / waist / ankle (appropriate for discipline)
            2. Hang-up on surface and/or depth (line is stored coiled or with kinks, lack of proper start or bottom turn)
            3. Quick release doesn't function (lack of adequate freshwater rinse, secure pull-tap)
            4. Strap holding (Velcro is worn)
        viii. Counterbalances and Rig Systems:
        ix. Lift Bag Retrieval Systems:
    e. Depth Specific Problems:
        i. Blackout at depth / surface
        ii. LMC at surface

iii. Whiteout
iv. Equalizing; ears / sinuses
v. Chest or tracheal squeeze
vi. Pressure contractions
vii. Lanyard catching and slowing pace
viii. Loss of line / reference
ix. Too fast / too slow
x. Bail out

f. Static Apnea Problems:
i. Improper signals
ii. Near Blackout (LMC)
iii. Blackout
iv. Loss of airway control
v. Strong contractions
vi. Unresponsive
vii. Recovery breathing
viii. Edge of pool to close

g. Dynamic Apnea Problems:
i. Near Blackout (LMC)
ii. Blackout
iii. Loss of airway control (bubbles)
iv. Strong contractions
v. Speeding up / slowing down
vi. Cramps & lactic acid
vii. Losing technique and kick style
viii. Disorientation / lane reference
ix. Recovery breathing
x. Weighting

8. Barotraumas – Pressure Related Injuries
a. Middle ear barotraumas – during a continuous fast descent without equalization
b. Barotitis media
c. Sinus squeeze
d. Alternobaric vertigo
e. Transient vertigo
f. Perforated tympanic membrane (TM)
g. Tooth squeeze
h. Reverse block
i. Mask squeeze
j. Lung over-pressurization
k. Lung/tracheal squeeze

9. Decompression Illness (DCI) and Technical Freediving
    a. Decompression Illness and Freediving:
        i. Decompression sickness – excessive accumulation and release of nitrogen from body tissues
            1. Bubbles form causing;
            2. Surface intervals to avoid DCI
    b. Technical Freediving:
        i. 100% Oxygen can be used as a recovery agent for Advanced Freediving
        ii. Freedivers cannot breathe 100% O2 and dive immediately for risk of oxygen toxicity
        iii. Effects of varying partial pressures on a person breathing 100% oxygen –
            1. CNS oxygen toxicity – NOAA CNS oxygen exposure limit
                a. Freedivers at increased risk because of CO2 retention work fatigue as well as potentially reduced Gamma Aminobutyric Acid (GABA) a brain wave modulator
        iv. Signs & Symptoms of Oxygen Toxicity (CONVENTID)
            1. CONvulsions
            2. Visual disturbances
            3. Ear ringing
            4. Nausea
            5. Tingling
            6. Irritability
            7. Dizziness
    c. Basic O2 Rules and Protocols
        i. 5min O2 flush (recommended after for depths deeper than 40m/132ft)
        ii. Surface O2 only (compressed gas / lung expansion issues)
            1. 5 min off 02 (breath normal air before any further freediving)
    d. Safety Note:
        i. Unless trained and certified in the use of compressed oxygen and nitrox Safety Freedivers can only monitor the Basic O2 Rules and Protocols set above. They cannot assemble or breakdown Technical scuba systems for use or use Technical systems for any reason other 5min O2 flush

10. Safety Freediver Equipment Workshop
    a. First Aid & O2 Assembly Workshop:
        i. First aid, emergency O2, and technical freediving O2 assembly set-up and check for use
    b. Counterbalances Assembly Workshop:
        i. Hands on workshop to assemble and review all parts of an FRS
    c. Lanyard Assembly Workshop:
        i. Check to ensure lanyard compliance for safe operation
        ii. Demonstrate proper lanyard location for each discipline
        iii. Activate emergency release

7.12 Confined Water

To be certified as a PFI Safety Freediver students must demonstrate the following skills to the satisfaction of the PFI Instructor:

1. Watermanship and Stamina (May be completed in open water. If done in open water, must be completed prior to any other open water skills)
    a. Distance swim of 200 metres non-stop using any stroke without the use of swimming aids (mask or swim goggles may be used), **or** 300 metres nonstop using mask, snorkel, and fins
    b. Tread water for 10 minutes without floatation

Note: If an exposure suit is worn for any of the above skills, the wearer must be neutrally buoyant at the surface.

2. Static Apnea Mockup
    a. Class is split into two groups – safety and performer
    b. Safety group will react to issues provided to the performer group
    c. Perform a series of at least 4 static mockups where the instructor gives those performing the statics realistic problems that are commonly seen
    d. Safety will respond with appropriate levels of correction
        i. "give me a signal" "give me a stronger signal" "don't hold your signal"
        ii. Telling the performer to relax appropriate areas that are showing tension
        iii. Perform appropriate rescues as previously taught
    e. Last static will always end in a full blackout with at least two rescue breaths

3. Dynamic Apnea Mockup
    a. The Instructor with split the class into two groups – safety and performer
    b. Perform a series of at least 4 dynamic mockups where the instructor gives those performing the dynamic realistic problems that are commonly seen in dynamic scenarios
    c. Last dynamic will always end in a full blackout on the bottom, with rescuer pulling the freediver off the bottom, rotating under the freediver so that the freediver surfaces face up, perform blackout procedures to at least two rescue breaths
4. Lifeguard Skills:
    a. Talk and encourage the person in all situations
        i. Drop your belt
        ii. Lay on your back
        iii. Come to me
5. Surface/Deck Response
    a. Establish low and anchored body positioning
    b. Use shepherd's hook, throw buoy, reach assist
    c. Continuous talk and encouragement
    d. Demonstrate for active and passive panic
6. Tired Diver Tow
    a. Arm hook / dosey-doe tow
        i. Ready to give breaths if necessary
    b. Arm pull
    c. Leg push
7. In-Water Response: Passive & Responsive
    a. Swim approach with float
    b. On guard body positioning
    c. Maintain 3m/6' distance
8. In-Water Response: Passive & Unresponsive
    a. Swim approach with float
    b. On guard body positioning
    c. Swim around behind tired diver when approaching
9. In-Water Response: Active & Responsive
    a. Swim approach from behind with float
    b. On guard body positioning
    c. Approach and remove weight-belt underwater

10. In-Water Response: Active & Unresponsive
    a. Swim approach from behind with float
    b. On guard body positioning
    c. Approach and remove weight belt underwater
11. Front Approach: Breaks & Release
    a. Face to face approach and panic attack
    b. Freediver Supervisor tuck chin, secure under armpits, push victim vertical and behind Freediver Supervisor
        i. Freediver Supervisor swims away underwater maintaining 3m distance and on guard stance
12. Back Approach: Breaks & Release
    a. Back to face approach and panic attack
    b. Freediver Supervisor tuck chin, secure under armpits, push victim vertical and forward of Freediver Supervisor
        i. Freediver Supervisor swims away underwater maintaining 3m distance and on guard stance
13. Unconscious Freediver Exits
    a. One-person ladder exit
    b. Two-person deck exit

7.13 Open Water

The following open water skills are to be briefed, evaluated, practiced, and debriefed by the PFI Instructor and/or PFI Assistant Instructor as outlined in the General Standards and Procedures section.

- During all warmups, and during appropriate skills, all students will act in a buddy team, surface safety and breath holder.

To be certified as a PFI Safety Supervisor a student must demonstrate the following skills to the satisfaction of the PFI Instructor as follows:

1. Open Water Training Sessions
    a. A minimum of one ocean session must be completed
2. Equipment
    a. Prepare without assistance of the instructor
    b. Buddy check all equipment
    c. Entry Procedure most appropriate for local environment

3. Recovery Breathing and Coaching
    a. Buddy A – recovering freediver
        i. Proper upper lung exhalation in last 2m/6ft
        ii. Position both hands on float
        iii. Show proper 3 hook and 3 cleans breaths on the upper half of lung volume
        iv. Holding a full 3sec count during Hook breaths
        v. Employ surface protocols
        vi. Signal OK when asked by surface safety after 30sec
    b. Buddy B – surface safety
        i. Position 90 degrees to surfacing freediver
        ii. Providing visual and audio counts during recovery breathing
        iii. Use 'float' hand for counts
        iv. Coaching a full 3sec count during Hook breaths and count off cleansing breaths
        v. Signaling OK after 30sec on surface
4. Safety Scenarios
    All students must successfully participate in all positions of a safety team, including participating the rotating to depth relieving the primary, or secondary, as well as having pulled up a blacked-out freediver utilizing the FRS.
    a. 30m – 39m Recreational Scenario Assistance with LMC
        i. PFI Instructor simulates 40m/132ft freedive with 20-30 seconds of bottom time, Simulating a recreational dive
            1. Completes dive
            2. Has LMC after 3rd hook breath
        ii. Primary Safety Freediver – 15m/50ft
            1. Primary meets at 15m/50ft
            2. Proper position 45-degrees from diver
            3. Provides support for LMC - recreational
        iii. Secondary Safety Freediver – 10m/33ft
            1. Secondary meets at 10m/33ft
            2. Proper position opposite Primary Safety behind freediver
    b. 40m - 49m Competition Scenario Assistance with LMC
        i. PFI Instructor simulates 50m/165ft freedive
            1. Reaches safety depth late (too slow on dive)
            2. Asks for assistance (before reaching safety if desired)
            3. Has LMC after 3rd hook breath

ii. Primary Safety Freediver – 20m/66ft – Secondary Safety Freediver – 15m/50ft
    1. Recognize and responds to 'somethings wrong' signal by 15m/50ft
    2. Provide lift assistance during ascent
    3. Provides proper LMC support for disqualified diver (diver asked for assistance)
iii. Secondary Safety Freediver – 15m/50ft
    1. Recognize and responds to 'somethings wrong' signal at 15m/50ft
    2. Provide lift assistance during ascent
    3. Provides proper LMC support for disqualified diver (diver asked for assistance)
iv. Clutch
    1. Count down timer plus diver time
    2. If Primary or Secondary calls the dive
        a. Call out "EMERGENCY, EMERGENCY, EMERGENCY"
        b. Activate FRS
        c. Place foot against carabiner under float
        d. Pull plate to surface as fast as possible

c. 50m – 59m Competition Scenario with B/O
i. PFI Instructor simulates 55m/180ft freedive
    1. Reach safety depth early
    2. Ask for assistance (before reaching safety if desired)
    3. BO by 10m/33ft
    4. Come around after 3 'BLOW, TAP, TALKS' and 2 full breaths
ii. Primary Safety Freediver – 20m/66ft – Secondary Safety Freediver – 15m/50ft
    1. Recognize and respond to 'somethings wrong' signal at 15m/50ft
    2. Provide lift assistance during ascent
    3. Recognize blackout 10m/33ft below surface
    4. Airway control 'head sandwich' to horizontal
    5. Switch arms into the 'Dosey Doe' position
    6. Remove mask and provide 3 'BLOW, TAP, TALKS' and 2 full breaths, initiate help, and continue rescue breaths for at least 2 rounds of breaths

iii. Secondary Safety Freediver – 15m/50ft
    1. Recognize and respond to 'somethings wrong' signal at 15m/50ft
    2. Provide lift assistance during ascent
    3. Removes lanyard from line
    4. Immediately assists with 'Dosey Doe'
iv. Clutch
    1. Count down timer plus diver time
    2. If Primary or Secondary calls the dive
        a. Calls out "EMERGENCY, EMERGENCY, EMERGENCY"
        b. Activates FRS
        c. Places foot against carabiner under float
        d. Pulls plate to surface as fast as possible

d. 60m Competition Scenario Blackout at Depth
    i. PFI Instructor simulates 60m/197ft freedive
        1. Blackout at depth
        2. Allows plate to catch lanyard and bring to safeties at 15m/50ft
    ii. Primary Safety Freediver – 20m/66ft
        1. Calls dive at the 1:50 mark on freedive
        2. Calls for switch
        3. Ascends to surface
        4. Breathes up to make additional dives
    iii. Secondary Safety Freediver – 15m/50ft
        1. Repeats primary's call of dive
        2. Waits for Primary On-Deck to relieve at 15m/50'
        3. Ascends to surface
        4. Breathes up to make additional dives
    iv. On-Deck Primary – On-Deck Secondary
        1. Manages freediver's position prior to the dive, and secures pillow/float after freediver's entry
        2. Recognizes called dive
        3. Descends to 15m/50ft to relieve Safety at depth
        4. Ascends when relieved by another diver
        5. Breathes up to make additional dives

v. Clutch
    1. Count down timer
    2. Calls out "EMERGENCY, EMERGENCY, EMERGENCY" when primary and secondary call dive
    3. Activates FRS
    4. Places foot against carabiner under float
    5. Pulls plate to surface as fast as possible
vi. Safety at depth when freediver arrives at 15m/50'
    1. Immediately protects airway 'head sandwich'
    2. Ascends to surface, then horizontal on to back
    3. 3 – blow-tap-talks, two rescue breaths
    4. Calls for help
    5. Continue rescue breathing while swimming around rig
vii. Safety swimming down to relieve diver at depth when freediver/plate reaches 15m/50'
    1. Assists with ascent
    2. Removes lanyard from line
    3. Gets into "Dosey Doe" position on opposite side of primary
    4. Assists with swimming around rig
    5. Waits for primary to call to switch rescue breathing

5. Maximum Safety Threshold Dive (optional)
    a. Primary Safety Freediver – 25m/82ft to 40m/132ft
        i. Makes dive to next 5m/16ft safety depth
        ii. Waits 20 seconds
        iii. Calls dive
        iv. Protects airway with "head sandwich"
        v. Swims blacked-out diver to the surface, performs surface blackout protocols until at least one additional rescue breath after calling for help
    b. Secondary Safety Freediver
        i. Follows Primary down per protocols, 10 seconds after, 5m/16ft shallower
        ii. Secondary will act as the Safety for the Primary as this is a working threshold dive for the Primary

7.14 Graduation Requirements

In order to successfully complete the course Students must

1. Successfully complete all the knowledge development, confined water and open water training sessions. Open water training is not necessary for Pool Only certification.
2. Demonstrate mature and sound judgment concerning planning and execution.
3. Achieve a passing score of 80% on the final exam and show whole knowledge comprehension.

Instructors must:

1. Process the registration within 7 days of course completion

8. Advanced Freediver

8.1 Introduction

This is the most advanced level certification course for individuals wishing to expand their knowledge of breath hold diving beyond the Intermediate Freediver level for the purpose of increasing underwater awareness and performance. In this course individuals develop advanced level knowledge of the physics and physiology of freediving below residual lung volumes and the associated risks, as well as advanced equalization techniques beyond equalizing thresh-hold. Participants will practice freediving specific skills and techniques to maximum depths no deeper than 60m / 197ft while achieving a minimum depth of 40m/132ft utilizing advanced sink phases and negative pressure training with moderate packing, along with advanced techniques for static apnea to 4:00 and dynamic apnea development for 75m.

A PFI Advanced Freediver Pool Only certification may be issued to those not wishing to participate in open water training.

8.2 Course Objectives

The objective of this course is to train individuals in the benefits, skills, techniques and safety & problem management for Advanced level freediving to a minimum depth of 40m/132ft using an unmodified commercially available freediving mask, with extended level static apnea development of 4:00 at a minimum, and optional dynamic apnea development of 75m.

8.3 Program Prerequisites

1. 16 years old
2. Competent swimming skills
3. PFI Safety Freediver (can be combined with Advanced Freediver however minimum course requirements from both courses must be met.)

8.4 Required Student Equipment

1. Freediving quality mask, fins (note – bi-fins are required for safety, a mono-fin is allowed for target dives), snorkel
2. Freediving quality exposure protection (appropriate for local environment)
3. Freediving quality waist and neck weight belt and weights (appropriate for local environment)
4. Freediving computer and timing device
5. Freediving AIDA sanctioned lanyard
6. Neck pillow and float

8.5 Support Materials

Student Materials:

1. *PFI Medical* Statement
2. *PFI Liability & Assumption of Risk* form

Instructor Materials:

1. *PFI Advanced Freediver* Presentation

8.6 Qualification of Graduates

1. Upon successful completion of this course, graduates may engage in freediving activity without direct supervision of an instructor to depths no greater than 60m/197ft, with a minimum 4-person buddy team utilizing a freediver retrieval system for freedives greater than 40m/132ft

Upon successful completion of this course, graduates are qualified to enroll the PFI Freediver Supervisor Program.

Freedivers may be certified with an Advanced Freediver-Pool Only certification after successfully completing all Knowledge Development and Confined Water training sessions. There is no open water training necessary for this level of certification and divers at this level are not certified for any open water activities.

8.7 Who May Teach

This course may be taught by any active PFI Advanced Freediver Instructor.

8.8 Student to Instructor Ratios

Classroom

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

Confined Water

1. A maximum of eight students to one PFI Advanced Instructor (8:1). Or maximum of twelve students to one PFI Advanced Instructor (12:1) with the use of one active status PFI Assistant Advanced Freediver Instructor max.

Open Water

1. A maximum of six students to one PFI Advanced Instructor (6:1). Or a maximum of ten students to one PFI Advanced Freediver Instructor (10:1) with the use of one active status PFI Assistant Advanced Freediver Instructor max.

8.9 Depth Restrictions

Open Water

1. Maximum open water depth of 60meters/197 feet.

Confined Water

1. Maximum confined water depth of 10 meters/33 feet10.9

8.10 Recommended Course Hours

Classroom Time

1. 22.0 Hours

Confined Water Time

1. 8.0 Hours

Open Water Time

1. 20.0 Hours

8.11 Knowledge Development Overview

The following topics must be covered during this course by the PFI Advanced Freediver Instructor and/or active status PFI Advanced Freediver Assistant Instructor as outlined in the PFI General Standards and Procedures section. However, instructors may use additional texts or materials they feel help present these topics.

1. Introduction
    a. Participant and staff Introductions
    b. Course overview
    c. Paperwork and prerequisites
    d. Equipment requirements check
    e. Classroom, confined and open water protocols and conduct
    f. Safety / supervision practices
2. Advanced Safety & Problem Management
    a. Advance Weighting Precautions
        i. Advanced freedivers will be neutrally buoyant at 15m/50' on a peak inhalation plus packing
        ii. The freediver may be negatively buoyant at the surface on an exhalation due to packing
        iii. Lanyards and a freediver recovery system must be used.
        iv. Supervision and safety is increased at the advanced level due to surface buoyancy without packing.
    b. Exhalation Statics
        i. 1st level exhalation warm up statics.
        ii. Required signals start at the 15 second mark
        iii. Signals must be performed at a minimum of every 15 seconds
        iv. No bubbles on LMC or Blackout
3. Technical Freediving Protocols
    a. O2 Use for Advanced Freediving
        i. 100% Oxygen can be used as a recovery agent for Advanced Freediving
        ii. Freedivers cannot breathe 100% O2 and dive immediately for risk of oxygen toxicity
        iii. Effects of varying partial pressures on a person breathing 100% oxygen –
            1. CNS oxygen toxicity – NOAA CNS oxygen exposure limit
                a. Oxygen can only be used at the surface.
                    i. A minimum break of 5 minutes is required before any freedives.

iv. To avoid O2 toxicity, it's recommended that freedivers breathe O2 for 5:00 after a target dive, then breathe air for no less than 5:00 before descending to any depth
v. Signs & Symptoms of Oxygen Toxicity

4. Equipment for Advanced Freediving Workshop and Equipment Check
    a. Masks & Fluid Goggles Workshop
        i. Mask features and types
        ii. Fluid goggles
            1. Benefits and drawbacks
        iii. No goggles
        iv. Nose clips
    b. Mono-fins vs. Bi-fins
        i. Benefits and drawbacks of each style
        ii. Blade materials
        iii. Exposure Protection Repair Workshop
        iv. Wetsuits
            1. Two-piece or One-piece suits
            2. Wetsuit features
                a. Competition wetsuits vs. regular freediving wetsuits
            3. Wetsuit Buoyancy
        v. Hoods
            1. Ear holes
    c. Freediving Computers Workshop
        i. Freediving computer & timers
            1. Features
            2. Implementation for mouth fill
            3. Proper maintenance
    d. Weighting Workshop
        i. Types of weight systems
            1. Waist belt
                a. Right hand quick release
                b. Features
                c. Styles
                d. Benefits
        ii. Neck weights
            1. Features
            2. Styles
            3. Benefits

e. Lanyard Check
    i. Check to ensure lanyard compliance for safe operation
    ii. Demonstrate proper lanyard location for each discipline
    iii. Activate emergency release
f. Personal Floats & Mesh Bags
    i. Neck / knee / ankle personal floats
        1. Mesh bags
        2. Attachment points

5. Advanced Freediving Breathing Techniques
    a. Advanced Breathing Techniques
        i. Packing – Glossopharyngeal Inhalation
            1. Technique
            2. Dangers and signs to terminate packing.
        ii. Reverse packing – Glossopharyngeal Exhalation
            1. Technique
            2. Dangers and signs to terminate reverse packing.
        iii. Workshop
            1. While sitting or lying down trying to add or remove air from a water bottle
            2. Start with one pack and gradually work up to more packs and reverse packs
            3. Packing stretches
            4. Peak inhalation with gradual packs
            5. Series of 4 stretches: left, right, front, and back
            6. Completed 3 times with gradually more packs
        iv. Reverse packing
            1. Exhalation to residual volume with reverse packs
            2. Used in coordination with negative diaphragm stretches
    b. Recovery Breathing and Surface Protocol (SP)
        i. Upon surfacing, performer must do the following within 15 seconds:
            1. Remove all facial equipment
            2. Give the 'okay' signal
            3. Say "I'm okay" or "I am okay" in English
        ii. Recommended to practice doing 3 hook breaths first, then begin SP
        iii. Performer's airway must not submerge for 1:00 or until judges show cards
        iv. Safety Freedivers cannot touch the performer until a judge advises or shows the card

6. Advanced Freediving Physics, Physiology and Techniques: Depth & Pressure
    a. Advanced Depth and Pressure on Physiology
        i. Depth compression to 7 ATA
            1. lung volume
            2. equalizing
        ii. Residual volume
        iii. 6 freedivers airspaces affected by Boyle's law
            1. Lungs
            2. ears
            3. sinuses
            4. GI
            5. mask
            6. wetsuit
    b. Effects of Immersion and Negative Pressure Breathing
        i. "On-back" horizontal position
            1. Benefits
            2. Potential issues
    c. Negative Pressure Dives
        i. Reasons to perform negative pressure
        ii. Performed in the pool or in open water
        iii. Utilizes progressively greater levels of exhalation
        iv. Physics
            1. A 1st level exhalation has an equal lung volume on the surface that a peak inhalation has at 20m/66ft/3ATA
            2. In a 5m/16ft/1.5ATA dive 1st level exhale, simulates 35m/116ft from an equalizing/chest compression standpoint = 3ATA X 1.5ATA = 4.5ATA or 35m
            3. 2nd level = peak at 30m/99/4ATA so the same 5m/16ft/1.5ATA dive equals 4ATA X 1.5 ATA = 6ATA or 50m/165ft
            4. 3rd level = peak at 40m/132ft/5ATA so 5ATA X 1.5ATA = 7.5ATA or 65m/212ft
            5. The depths simulated quickly increase with small jumps in actual depth achieved
            6. 1st level at 10m/33ft/2ATA is 50m/165ft, at 15m/50ft/2.5ATA is 65m/212ft

v. Physiology and safety
    1. Due to the higher levels of chest compression there are risks associated
    2. Thoracic squeezes
    3. Head position
    4. Bottom turns
    5. Safety precautions
    6. Thoracic filling
    7. Presence of bubbles
vi. Benefits of negative pressure dives

d. Pressure and Body Airspaces
    i. Thoracic filling
        1. Causes

e. Barotraumas – Pressure Related Injuries
    i. Middle ear barotraumas
        1. Signs and symptoms.
        2. Effects of depth on middle ear.
    ii. Barotitis media
        1. Signs and symptoms
        2. First aid
    iii. Sinus squeeze
        1. Signs and symptoms
        2. First aid
    iv. Alternobaric vertigo
        1. Signs and Symptoms
        2. First aid
    v. Transient vertigo
        1. Signs and Symptoms
        2. First aid
    vi. Perforated tympanic membrane (TM)
        1. Causes
        2. Signs and Symptoms
        3. First aid
    vii. Tooth squeeze
        1. Causes
        2. Signs and Symptoms
        3. First aid

viii. Reverse block
    1. Causes
    2. Signs and Symptoms
    3. First aid
ix. Lung/tracheal squeeze
    1. Signs and Symptoms
    2. Causes
    3. First aid
    4. Three types of squeezes
        a. Type 1 – small traces or streaks of blood seen in spit
            i. First Aid
        b. Type 2 – Mostly bright red blood in spit
            i. First Aid
        c. Type 3 – Blood upon surfacing, coughing, blood for several days, or a re-squeeze of a type 1 or type 2
            i. First Aid
    5. Persistent cyanosis & shortness of breath from any squeeze should include 100% o2 and hospital care.Mask squeeze
        a. Signs and Symptoms
        b. Causes
        c. Prevention
        d. First aid
        e. Lung over-pressurization – air expansion within the lungs
        f. Signs and Symptoms
        g. Causes
        h. First aid

f. Decompression and Freediving - Technical Freediving
    i. Signs and Symptoms
    ii. Causes
    iii. Prevention
    iv. First aid

7. Advanced Equalization Techniques
    a. Equalization Techniques
        i. Throat block
        ii. Equalizing ears, sinuses, and mask
        iii. With mask vs. without mask

iv. Changes with 30m/99ft-40m/132ft
    1. Residual volume
    2. Mouth filling.
    3. Head position
v. Voluntary Tubular Opening (VTO)
    1. Frequency
    2. Methods
    3. Benefits
vi. Frenzel
    1. Frequency
    2. Methods
    3. Benefits
vii. Equalizing thresh-hold
    1. Grouper call or reverse pack
    2. Alarms and kick counts
    3. Tongue position
viii. Negative pressure training
    1. Simulate lungs at deeper depths
    2. Mouth-fills and Frenzel practice
    3. Head positioning
    4. 10.18 Psychology of Advanced Freediving

b. Anxiety Stimulus
    i. Physiology of stress
        1. Symptoms
        2. Causes – real and imagined
        3. Physical Stress
        4. Physiological Stress
        5. Psychological Stress
    ii. Stress Reduction
        1. Stop – Think – Act
        2. Training
        3. Preparation and prevention
        4. Skills practice and in-water comfort
        5. Confidence in buddy and support
        6. Maintain equipment
        7. Employ psychological techniquesSelf-talk
        8. Step by step
    iii. Compensatory changes
    iv. Visualization

c. Designing Your Warm-up Routine
    i. Athletes are given 45:00 to warm up before their target (Official Top, OT)
    ii. For depth disciplines, you can use this time to do facial immersion, free immersion (FIM), negative pressure FIM, and final breathe-up
    iii. It is recommended but not required that your warm-ups are not deeper than 20m
    iv. For pool disciplines, a combination of facial immersion and shorter statics (inhalation or exhalation, wet or dry) are recommended
    v. Warm-up routines are to kick in mammalian dive reflexes and psychologically prepare the athlete for their target performance
    vi. If not regularly training, your warm-up routine may start with a greater number of dives or breath-holds
    vii. If training consecutively for days or weeks, you may not require many warm up dives or breath-holds before the target performance
    viii. When designing your warm-up:
        1. Leave yourself enough cushion time for accidentals (water intake on peak inhale, equipment adjustments, etc.)
        2. Calculate time of your warm-up and subtract that from OT
            a. If your OT is 00:45, and your warm-up only takes 00:30, wait to start your warm-up until 00:15
    ix. DESIGN YOUR OWN OCEAN & POOL WARM UP ROUTINES

8. Advanced Freediving Training – Dry, Gym, Pool and Ocean
    a. Proper Hydration for Freediving
        i. Loss of Fluids
            1. Sweating
            2. Breathing
            3. Urinating
        ii. Dehydration
            1. Fatigue
            2. Impaired Blood Shunt
            3. Increases risk of DCI
        iii. Fluid Intake Before and During Exercise
            1. What Is the Best Drink Composition
        iv. Fluid Intake After Exercise
            1. What Is the Best Drink Composition

b. Working Heart Rate Zones
    i. Calculating training zones
        1. Maximum heart rate
        2. Resting heart rate
        3. Calculating the zone value
    ii. Energy Efficient or Recovery Zone – 60% - 70%
    iii. Aerobic Zone – 70% - 80%
    iv. Anaerobic Zone – 80% - 90%
c. Recovery
    i. Speeding up recovery
    ii. Refueling
    iii. Muscle repair
    iv. Re-hydration
    v. Immune system
d. Pool Training for Performance
    i. Pool program A – techniques & cardio / strength training
    ii. Pool program B – Technique & Co2/O2 tolerance training
    iii. Pool program C – Targets and Co2/O2 training
e. Gym Training for Performance
    i. Weight training – legs
    ii. Cardio training
f. Daily Food & Fitness Log
    i. Keep track of food and water intake
    ii. Note how you felt
    iii. Note how the workout that day went – what worked, what didn't
g. Freedive logs
    i. Keeps track of your dive day
    ii. Includes:
        1. Equipment
        2. Warm-up
        3. Water conditions
        4. Depths hit
        5. Notes
h. Long term training program development
    i. Work with a coach
    ii. Set goals
        1. Short term
        2. Moderate term
        3. Long term

i. Co2 & O2 tolerance training
    i. O2 tolerance
    ii. Co2 tolerance
    iii. Inhalation vs Exhalation training
j. Equalization training
    i. Daily X200 equalizations
    ii. Exhalation and reverse packs
k. Stretching programs
    i. Packing stretches
    ii. Negative diaphragm
l. Negative pressure training
    i. Quickly repetitive equalization and chest compression practice
    ii. Establish streamlined sink phase at shallower depths
    iii. Practice depth bottom turns shallower

8.12 Confined Water

The following confined water skills are to be briefed, demonstrated, evaluated, practiced and debriefed by the PFI Advanced Freediver Instructor and/or certified active PFI Advanced Freediver Assistant Instructor as outlined in the PFI General Standards and Procedures section.

- During all skills a buddy A and buddy B pair (performer and surface safety) should be practiced where applicable to reinforce proper direct supervision procedures.
- Students should, where applicable, treat the confined water as an 'open water environment' and employ all protocols consistent with ocean freediving.

To be certified as a PFI Advanced Freediver a student must demonstrate the following skills to the satisfaction of the PFI Instructor as follows:

1. Watermanship and Stamina (May be completed in open water. If done in open water, must be completed prior to any other open water skills)
    a. Distance swim of 200 metres non-stop using any stroke without the use of swimming aids (mask or swim goggles may be used), **or** 300 metres nonstop using mask, snorkel, and fins
    b. Tread water for 10 minutes without floatation

Note: If an exposure suit is worn for any of the above skills, the wearer must be neutrally buoyant at the surface.

2. Open Water Simulation – 40m depth
    a. Breathe up on back with 5 purges(packs if utilizing)
    b. Descend with appropriate kick cycles lasting 30 seconds.
    c. 10 seconds relaxed no intermittent kicking (sink phase)
    d. Relaxed bottom kicking for 40 sec or kick horizontal for 40m dynamic
    e. Proper ascent in deep end with depth recovery breathing and buddy coaching
3. Static / Dynamic Apnea
    a. Static apnea
        i. Students must perform as Buddy A and Buddy B; breath-holder and safety
        ii. Minimum of 4 consecutive static breath-holds
        iii. Complete a minimum 4:00 static apnea without any hypoxic symptoms
        iv. Safety procedures
        v. Supervision with signals starting at:
            1. 1min on pool session one
            2. 2min on pool session two if participant hit 3:00 static on pool session one
            3. For third and fourth pool sessions signals are given by the discretion of the student, in addition minimum static signal standards
            4. Additional signals may be required by the PFI Professional's request
        vi. Timing and safety signals
        vii. Recovery breathing and support assistance
    b. Exhalation Static apnea
        i. Students work as Buddy A and Buddy B; breath-holder and safety
        ii. Students will use exhalation statics as warm-ups for max statics
        iii. Exhalation statics are used for a stressed warm-up for a more relaxed target
        iv. Utilize a relaxed 1st Level Exhale
        v. Start signals at 0:15 and be given every 15 seconds

   c. Dynamic apnea (optional)
      i. While optional, students are encouraged to participate in dynamic apnea.
         1. Students work as Buddy A and Buddy B; dynamic and safety
         2. Minimum of 3 dynamic performances
         3. Dynamic apnea streamlining & kick technique
         4. Safety procedures
            a. Surface safety with flotation
            b. Recovery breathing and surface support assistance
4. Negative Pressure Dives
   a. Students work as Buddy A and Buddy B; switching back and forth after each dive
   b. Maximum of 6 negative pressure dives in one session
   c. Complete at a minimum, third level exhalation with proper equalization at a minimum depth between 3m/10ft or third level exhalation with 3 reverse packs for pools less than 3m/10ft with proper recovery breathing and without any hypoxic symptoms, causing persistent ear barotraumas or thoracic squeezes

8.13 Open Water

The following open water skills are to be briefed, may be demonstrated if a newly introduced skill, evaluated, practiced and debriefed by the PFI Advanced Freediver Instructor and/or certified active PFI Advanced Freediver Assistant Instructor as outlined in the General Standards and Procedures section.

- During all skills a buddy A and buddy B pair (performer and surface safety) will be practiced to reinforce proper direct supervision procedures.
- At the discretion of the instructor for students that have already achieved close to 40m/132ft, neutral buoyancy and dive depth progression can be adjusted deeper, keeping safety and safe progression in mind.

To be certified as a PFI Advanced Freediver a student must demonstrate the following skills to the satisfaction of the PFI Instructor as follows:

1. Open Water Training Sessions
   a. A minimum of four (4) separate ocean sessions must be completed

2. Proper Weighting and Buoyancy
    a. Neutral Buoyancy at 15m/50ft – 20m/66ft on peak inhalation with packing – depth at instructor's discretion
        i. Achieve neutral buoyancy to the .5kg/1.0 lbs.
        ii. No sculling, finning, treading, or pushing off plate
3. Proper Fin Use
    a. Kick cycles
        i. Demonstrate Proper kick cycles determinations to landmark depths
            1. To neutral buoyancy depth – kick cycles
            2. From neutral buoyancy to double neutral buoyancy – kick cycles
            3. From double neutral buoyancy to double neutral plus 10m/33ft – intermittent kick cycles
4. Equalization Threshold
    a. Establish the maximum mouth fill threshold
        i. Must be able to complete a mouth fill while head down no shallower than 25m/82ft
5. Free Immersion Warm-up Dives
    a. Twelve free immersion warm-up dives
        i. Complete a minimum of twelve (12) free immersion style freedives as a warm-up
        ii. Reach a minimum of 40m/132ft without any hypoxic symptoms or barotraumas
        iii. Employing the following proper techniques described below:
            1. Surface breathing on back and preparation
            2. Proper roll and go technique with lanyard attached to ankle
            3. Single leg raised descent
        iv. Facial immersion for 5min may be used
        v. A negative pressure dive with 1st level exhalation to a max 15m/50ft with 'touch and go' may be used for warm up
        vi. Student must show ability to breath up on back, while securing the line
        vii. 90-degree bend at waist
        viii. One leg vertical out of water
        ix. Double arm pull
        x. Grab line and hand to nose
        xi. "BEND, LEG, PULL & GRAB"

b. Free immersion descent procedures
    i. Stay in contact with descent line
    ii. Face line during descent
    iii. Maintain proper head 'neutral' position
    iv. Student must determine how many pull cycles to neutral, and pulls cycles to double neutral
    v. Equalizing frequently
    vi. Descend slow and relaxed
    vii. Utilize line for an effective bottom turn
c. Free immersion ascent procedures
    i. Stay in contact with ascent line
    ii. Slow and relaxed with head in neutral position
    iii. Recapture expanding air from mask if possible
    iv. 2m/6ft exhalation prior to surfacing
    v. Proper recovery breathing
d. Negative free immersion dives
    i. Use negative pressure dives to practice sink phase and bottom turns
    ii. Add additional neck weights to create appropriate 1m/sec speed at shallower depths 4-8lbs
    iii. Lanyard must be used
    iv. Employing the following proper techniques described below:
        1. Surface breathing on back and preparation
        2. Inhalations plus packing then relaxed sigh to 1st level exhalation
        3. Proper roll and go technique with lanyard attached to ankle
        4. Single leg raised descent
    v. Complete a series of negatives over the open water sessions
        1. 5m – 7.5m – 10m – 12.5m – 15m
    vi. A negative pressure dive with 1st level exhalation to minimum 15m/50ft required maximum of 20m/66ft

6. Self-Emergency Ascent Procedures
    a. Lanyard Entanglement and last resort ditch and ascent
        i. Descend to 15m/50ft
        ii. Demonstrate undoing a simple entanglement and ascend
        iii. Demonstrate the use of the lanyard quick release and ascend

7. Constant Ballast Target Dives
    a. Twelve target constant ballast dives
        i. Complete a minimum of twelve (12) constant ballast style freedives
        ii. Reach a minimum depth of 40m/132ft without hypoxic symptoms or barotraumas
        iii. Employ the following proper techniques described below:
            1. Surface breathing and preparation on back
            2. Peak inhalation, packing, roll and go, with lanyard attached to wrist
            3. Single leg raised descent or double with mono-fin
    b. Descent procedures
        i. Stay within arm's reach of descent line
        ii. Face line during descent
        iii. Maintain proper head 'neutral' position
        iv. Equalizing frequently and with arm 'tucked'
        v. Descend at approximately 1m/3ft a second
        vi. Determine kick-cycle number, speed, and depth determination
        vii. Employ sink phase after 30m/99ft or 40m/132ft with periodic correcting kick/mouth-fill
        viii. Drop arms at a deeper depth to maintain 1m/second by creating flat surfaces
        ix. Utilize line for an effective bottom turn
    c. Ascent procedures
        i. Double raised hand
        ii. Drop arms at 10m – 5m/33ft – 16ft
        iii. Recapture expanding air from mask if possible
        iv. 2m/6ft exhalation prior to surfacing
        v. Proper recovery breathing with surface protocol
8. Emergency Rescue & Problem Management (Rescue Scenarios)
    a. LMC at surface review
        i. PFI Instructor simulates a 30m/99ft freedive
            1. Has LMC after no less than 2 recovery breaths
        ii. Buddy B – 10m/33ft safety freediver
            1. Provides correct recovery breathing
            2. Provide correct arm support and airway protection
            3. Mask removal and blow across face if necessary
            4. Constant verbal encouragement
            5. Wait 30sec or until freediver is recovered

b. Blackout at surface review
    i. PFI Instructor simulates a 40m/132ft freedive
        1. Simulated LMC that progresses into BO after surface safety protects LMC
        2. Recovery after 3 'BLOW, TAP, TALKS'
    ii. Buddy B – 15m/50ft safety freediver
        1. Provides correct recovery breathing and LMC response
        2. Airway control 'head sandwich' to horizontal
        3. Switch arms into the 'Dosey Doe' position
        4. Remove mask and provide 3 'BLOW, TAP, TALKS'

8.14 Graduation Requirements

In order to successfully complete the course Students must

1. Successfully complete all the knowledge development, confined water, and open water training sessions. (Open water training is not required for a Pool Only certification)
2. Demonstrate mature and sound judgment concerning planning and execution.
3. Achieve a passing score of 80% on the final exam and show whole knowledge comprehension.
4. Achieve the required constant weight and free immersion dive minimums with an unmodified commercially available mask. (not required for Pool Only certification)
5. Complete the following skills
    a. Equipment
        i. Prepare equipment with minimal assistance
        ii. Buddy check all equipment
    b. Entry and exit
        i. Enter water with techniques appropriate for the environment
        ii. Signal buddy/shore/boat
        iii. Exit water with techniques appropriate for the environment
    c. Proper weighting and buoyancy
        i. Test for approximate neutral buoyancy at surface by floating upright at collar bone without sculling, finning, or treading.
        ii. After buoyancy has been established – either collarbone for pool only, or neutral buoyancy depth check during open water for Advanced Freediver, perform a first level exhalation at the surface – remain at the surface. However, this may not be possible in advance weighting situations due to packing, so lanyards should be used, and extra care always given to buddy supervision

d. Snorkel Use
    i. Successfully clear and blast the snorkel without removing the head from the water
e. Proper fin use
    i. Flutter kick at the surface
    ii. Maintain a stationary position with sculling
f. Descent and Ascent Procedures
    i. Surface breathing and preparation while on floating on back
    ii. Roll over to a face down horizontal position
    iii. Demonstrate a double leg raised entry or a single leg raised entry in the order of:
        1. Bend
        2. Leg(s)
        3. Pull
        4. Kick
    iv. Demonstrate proper ascent procedures
        1. Head in neutral position
        2. Recapturing expanding air in the mask if possible
        3. Exhale at approximately 2m/7 feet
        4. Proper recovery breathing
    v. During descents and ascents – student head position must remain neutral
g. Self-emergency Ascent Procedures
    i. Flooded mask ascent
        1. Fully flood at depth
            a. Pool only – deep end of pool
            b. Advanced Freediver – at 20m/66ft
        2. Remain at depth for approximately 10 seconds before ascending
        3. Ascent and recovery breathe in a controlled manner
    ii. Remove weight belt and ascend
        1. Remove weight on neck or waist belt (if no neck weight) at depth
            a. Pool only – deep end of pool
            b. Advanced Freediver – minimum 20m/66ft
        2. Ascend holding belt low at their side with buckle end down
        3. Perform proper recovery breathing
        4. Replace neck weight or weight belt at the surface with right hand release if waist belt

h. Recovery Breathing
    i. Proper exhalation from 2m/6ft
    ii. Position both hands on float/side of pool
    iii. Show proper 3 hook and 3 cleansing breaths on upper half of lung volume
    iv. Hook breaths are held for a full 3 seconds
i. Safety & Problem Management
    i. Assist with recovery breathing as a safety
        1. Be 2 meters/7 feet to 3 meters/10 feet to the side of the freediver
        2. Use audio coaching when necessary
        3. Remain attentive and vigilant for a minimum of 30 seconds after the freediver has surfaced
    ii. Respond to a simulated surface LMC as a Safety
        1. Physically support the freediver
        2. Keep one hand parallel to the water, above the water, but below the chin
        3. Speak calmly to encourage the freediver to breathe
        4. Maintain control until the freediver regains control
    iii. Respond to a simulated blackout at the surface
        1. Place the freediver on their back with the airway protected using a "head sandwich"
        2. Securely support the freediver's head with a "dosey-doe"
        3. Blow, tap, talk 3 times
        4. Maintain control until the freediver regains control
    iv. Assist with a simulated underwater blackout
        1. Recognize signal for assistance
        2. Physically support the freediver
        3. Ensure proper hand placement
        4. Recognize blackout before the surface
        5. Protect the airway with a "head sandwich"
        6. Perform surface blackout procedures through 2 rescue breaths once the student has ascended with the blacked out freediver

v. Lost Freediver – completed no deeper than 10m/33ft
    1. Surface swim minimum 25m/82ft looking for "lost" freediver
    2. Locate freediver, catch breath, breathe up
    3. Make proper entry and simulate 25m/82ft dive – 6 strong kick cycles – 6 soft kick cycles – 5 seconds intermittent kicks
    4. "Victim" descends after rescuer completes 6th strong kick cycle and will lay on the bottom next to the freediver
    5. After completion of 25m/82ft descent simulation, rescuer secures victim's airway with a "head sandwich"
    6. Ascend to the surface and place victim into "dosey-doe" and perform surface blackout rescue procedures
    7. Call for assistance and evacuate the victim 50m/165ft while simulating rescue breaths every 5 seconds