# 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