9.5 CMAS-ISA 3 STAR MASTER DIVER CERTIFICATE

CMAS EQUIVALENT – 3 STAR DIVER

(Depth limit – 40 meters)

9.5.1 OBJECTIVE

To supply a framework for the training of 2 Star Advanced Divers, enabling them to obtain the 3 Star Master Diver qualification. (Recommended maximum depth – 40 metres).

The 3 Star Master Diver is a fully trained, experienced and responsible diver who is considered competent to lead other divers of any grade in open water.

9.5.2 SYLLABUS

Prescribed manual: CMAS-ISA 3 Star Master Diver Manual/notes.

It is required of the candidate to possess diving theory knowledge. The following books are suggested alternative reading:
The One Star Diver Manual.
The Two Star Diver Manual.
The Oxygen Administration Manual.
The Search and Recovery Manual.
The SAUU Decompression Tables Manual.
The BSAC Small Craft Boatmanship for Divers.
The BSAC Diving Manual (Latest edition).
The BSAC Sport Diving Manual (Latest edition).
The BSAC Advanced Sport Diving Manual (Latest edition).
The BSAC Safety and Rescue for Divers Manual (Latest edition).
Deeper into Diving (John Lippman).
Safe Diving: A Medical Handbook for Scuba Divers (Dr. Allan Kayle).
Any comprehensive First Aid book.

THEORY LESSONS:

T1 Small boat handling
T2 Underwater navigation
T3 Underwater search and recovery techniques
T4 Compressor operation
T5 Medical and Accident management and treatment
T6 Dive planning and organising a group dive
T7 Physiology / Psychology / Physics review
T8 Diving equipment review

PRACTICAL LESSONS:

P1 Small boat handling
P2 Underwater navigation
P3 Underwater search and recovery rechniques
P4 Compressor operation
P5 Assisting a dive organiser/leader
P6 Acting as a dive organiser/leader
P7 Fitness and SCUBA skills

9.5.3 PREREQUISITES

To attend the 3 Star Master Diver Course/Seminar

1. Must be at least 16 years old.

2. Must be in possession of a medical certificate clearing the holder as fit to participate in the sport of underwater diving. A medical practitioner using the CMAS-ISA Sport Diver medical examination form must have carried out the medical examination not more than 12 months previously.
3. Must hold the CMAS-ISA 2 Star Advanced Diver certificate.
4. Must hold the CMAS-ISA Rescue Certificate.
5. A minimum of 40 dives is required to enrol on the course, of which 20 should be deeper than 18 metres. These dives must include the following:

    5.1 Seawater dives;
    5.2 Fresh water dives;
    5.3 Boat dives;
    5.4 Low visibility dives (less than 1 metre visibility)
    5.5 Night dives.

To apply for the 3 Star Master Diver Certificate:

6. Must attend a 3 Star Master Diver course run by registered 2 Star Instructor (Course Convenor). The course must include the following dives:

    6.1. 2 x 30-40 metre dives;
    6.2. 1 compass dive;
    6.3. 1 low visibility dive;
    6.4. 1 search and recovery dive;
    6.5. 1 dive where light underwater work is performed;
    6.6. 1 dive where the diver is roped to a surface tender.

7. Must pass a CMAS-ISA theory examination paper. A pass mark of 65% is compulsory;
8. Must pass the A, B, C & D practical tests.
9. After previous qualification, the candidate must have logged at least 40 additional dives of at least 15 minutes duration (except where the special nature of the dive precludes this), of which 20 must be deeper than 18 metres. Only 2 categories of dives may be logged per dive. All dives deeper than 30 metres must be signed off in accordance with Section 9.5.3.13.

These 40 dives must include a combination of the following categories:

    9.1 10x Sea-water dives;
    9.2 10x Fresh water dives;
    9.3 10x Boat dives;
    9.4 20x Dives to a depth of between 30 and 40 metres. Two dive plans must be submitted for approval and must be kept for future reference. Two of these dives may be done in a decompression chamber.
    9.5 5x Low visibility dives (less than 1m)
    9.6 5x Compass course dives
    9.7 5x Night dives
    9.8 2x Dives incorporating underwater searches using different search patterns on each dive
    9.9 1x Dive where light underwater work is performed
    9.10 1x Dive where the diver is roped to a surface tender

Note:

The logged dives should demonstrate the diver's broad experience of diving under varying conditions and ver a period of time suitable for the accumulation of skills and knowledge. The log should indicate those dives where the diver has been responsible for other divers or for the planning of the diving operation.

10. Act as a surface tender for a roped diver.
11. Simulate a rescue from a depth of 20m to the surface making use of buddy breathing. Simulate E.A.R. on the surface.
12. Must apply for the certificate through the Course Convenor. A valid medical certificate as stated in 9.5.3.2, as well as proof of dives done as per 9.5.3.9.1-10 must accompany the application.

13. Dives deeper than 30m may only be done once enrolled on the course and must be done with and signed off by a diver certified to dive deeper than 30m.

(Refer to limitations, section 3.1.5.2.4 in the Code of Practice).

NOTE: Part 12 must be done within 1 year of writing the theory examination. Failing which, 9.5.3.7 & 8 must be re-done.

The prerequisites mentioned above are the minimum required for the CMAS-ISA 3 Star Master Diver Certificate.

9.5.4 TRAINING PROGRAMME

The course must be conducted by qualified instructors and supervised by at least a Two Star Instructor. The course will require the availability of suitable open water diving sites, together with some specialised facilities. The dive experience element of the qualification will require the diver to accumulate a broad range of experience under varying conditions and varying depths.

CONTENT OF THEORETICAL LESSONS

T1 SMALL BOAT HANDLING

1. A preliminary to practical experience in small boat handling.
2. Basic seamanship, weather, tides.
3. "Rules of the road", obligations of the boat handler.
4. Buoyage.
5. Ropes and their use, knots.
6. Using boats for diving, types, suitability.
7. Outboard engines and their use.
8. Safety equipment and special equipment.
9. Boat handling techniques, launching, anchoring, loading, low speed/high speed, emergency action.
10. Safety afloat, emergency procedures.
11. Requirements for a diving boat.
13. Duties and conduct of divers on a diving boat.
14. Diving from a boat, recovery of divers, etc.

(Time: 90 minutes)

T2 UNDERWATER NAVIGATION

1. Natural navigation
2. The compass, types, suitability.
3. How to use a compass when diving.
4. Taking a bearing, planning a course.
5. Measuring distance, time, depth.

(Time: 40 minutes)

T3 UNDERWATER SEARCH AND RECOVERY TECHNIQUES

1. Situations requiring use of these techniques.
2. Planning and selection of appropriate techniques.
3. Search methods: compass search, Jackstay search, grid search, circular search, swim-line search.
4. Marking and evaluating an object.

5. Lifting with buoyancy, calculations.
6. Attaching lifting bags, air supply, executing the lift.
7. Safety considerations.

(Time: 60 minutes)

T4 COMPRESSOR OPERATION

1. Principles of operation of a compressor.
2. Purity of air, filtration.
3. Compressor controls.
4. Operating procedures, filling cylinder.
5. Use of storage bank and decanting principles.
6. Records and legal obligations.

(Time: 60 minutes)

T5 MEDICAL AND ACCIDENT TREATMENT AND MANAGEMENT

1. What can go wrong.
2. Avoiding accidents, importance of planning.
3. Actions in an emergency.
4. Weather and water conditions.
5. Condition of divers, fitness, health, experience.
6. Missing diver(s).
7. Boat breakdown.
8. Diving related problems.
9. Injuries.
10. Accident management.
11. Rescue management.
12. Rescue techniques.
13. First aid - EAR, CPR, shark attack, patient stabilisation
14. Aftercare management.

(Time: 60 minutes)

T6 DIVE PLANNING AND ORGANISING A DIVE GROUP

1. Composition of group.
2. Selection of dive site, access, transport.
3. Timetable, planning requirements.
4. Timetable and planning required for boat dives, sea dives, fresh water dives, deep dives, wreck dives, drift dives, tendered dives, very cold water dives, altitude dives, mixed gas dives, salvage dives, search techniques, etc.
5. Dive Plan.
6. Dive profiles, decompression tables, etc,
7. Personnel, dive group composition.
8. Equipment needs, safety equipment.
9. Diver briefing.
10. Diver log, records.
11. Safety precautions.
12. Back-up emergency systems.
13. Legal Responsibilities.

(Time: 60 minutes)

T7 PHYSIOLOGY / PSYCHOLOGY / PHYSICS

a. REVISION OF:

1. Physiology:

1.1	Heart and Circulation:	Basic anatomy, blood pressure and cardiovascular response to diving.
1.2	Lungs:	Basic anatomy and mechanics of breathing.
1.3	Temperature control:	Normal conditions, core temperature, abnormal conditions and temperature control.
1.4	Physiology:	The physiological effects on divers, adaptations and differences.

2. **Diving medicine/treatment/prevention of injuries:**

   2.1 All manifestations of Barotrauma, Air Embolism, Decompression Sickness, Hypo- and Hyperthermia, Shock, Nitrogen Narcosis, High Pressure Neurological Syndrome, Hyperventilation/Hypoxia of ascent, Shallow Water Blackout, Oxygen Toxicity, Carbon Monoxide and – Dioxide Poisoning, Vertigo/Alternobaric Vertigo, seasickness and Medical contra-indications to diving.

3. **Psychology:**

   3.1 Apprehension, Panic, Hydrophobia, Claustrophobia and other contraindications to diving, Human performance underwater, Stress.

4. **Physics:**

   4.1 Light: Sight, Refraction, Colour absorption and visibility.

   4.2 Sound: Speed, Direction and Communication.

   4.3 Temperature: Heat exchanges and Thermoclines.

   4.4 Laws: Boyle's, Charles's, Henry's, Dalton's, Archimedes' and Combined Gas Law.

b. THE CANDIDATES SHALL RECEIVE ADVANCED THEORY TUITION IN:

1. **Physiology**

   1.1 Lungs:Gas exchange, gas transport, diffusion and perfusion.

   1.2 Physical Fitness

   1.3 What is meant by fitness?

   1.4 How to get fit.

   1.5 Specific fitness with regards to diving.

   1.6 Physiology and how it relates to diver fitness.

(Time: 90 minutes)

T8 DIVING EQUIPMENT

1. Comprehensive knowledge of the construction, advantages/disadvantages, operation and maintenance required of:

   1.1 Cylinders, cylinder valves

   1.2 Demand valves

   1.3 Pressure, depth and time devices – submersible and others

   1.4 Thermal suits

   1.5 Basic equipment

   1.6 Weight belts

   1.7 BC's – different types and suitability

   1.8 Diving computers, etc.

2. National standards, legal requirements.
3. A general review of future trends and current developments.

(Time: 60 minutes)

CONTENT OF PRACTICAL LESSONS

P1 SMALL BOAT HANDLING

1. The student should gain sufficient experience to be capable of handling a small boat, up to 5.5m length, in normal diving conditions.
2. Checking and preparing a boat prior to use by divers.
3. Starting, loading, launching, leaving mooring/berth.
4. Operation under conditions not exceeding Force 4.
5. Techniques for use with divers, following divers, picking-up divers.
6. Action in an emergency, man overboard drill.
7. Return to mooring/berth and removal from water (if appropriate).

Note: If the student is in possession of a D.O.T Skippers certificate, this section maybe skipped.

(Time: 45 minutes)

P2 UNDERWATER NAVIGATION

1. Using a compass on land.
2. Using a compass on the surface.
3. Using a compass underwater.
4. Swimming in straight lines, swimming reciprocal courses.
5. Taking bearings and planning courses.
6. Measuring / estimating distance.

(Time: 60 minutes)

P3 SEARCH AND RECOVERY

1. Identify area to be searched.
2. Select technique to be employed.
3. Prepare equipment, brief personnel.
4. Carry out search plan, locate object.
5. Evaluate object and select lifting equipment.
6. Secure lifting equipment and bring object to surface.
7. Bring object ashore or to new location.

(Time: 2 – 3 hours)

P4 COMPRESSOR OPERATION

1. Pre-operation checks, starting procedure.
2. Inspection of cylinders prior to filling.
3. Connection of cylinders to compressor panel.
4. Charging operations, use of bank.
5. Shutdown procedure, care of filters.

(Time: 60 minutes)

P5 ASSISTING A DIVE ORGANISER/LEADER

1. Understand all the pre-dive planning requirements.
2. Consider the allocation of divers and dive-leaders/instructors.
3. Consider the timing requirements.
4. Ensure that equipment required is available/functioning.
5. Record all activity.
6. Plan for emergency procedures.
7. Adapt plan to site/facilities.

(Time: 4 hours)

P6 ACTING AS A DIVE ORGANISER/LEADER

1. As for P5, carried out under supervision but following student's plan.

(Time: 4 hours)

P7 FITNESS AND SCUBA SKILLS

a. To be carried out either in open water or a swimming pool wearing either a swimsuit only or a wetsuit with neutralising weight belt.

1. Swim 200m freestyle. No rest allowed during the swim. Crawl, breaststroke or butterfly style may be used.
2. Without landing or rest, retrieve an object with an apparent weight of 1,5kg from a depth of not less than 5m and support it on the surface for at least 2 minutes.
3. Rest for 1 minute.
4. Submerge and hold breath for 2 periods of 20 seconds, each with an in-between surface interval of ten seconds.

b. To be carried out in open water under controlled conditions wearing basic equipment only. A wetsuit together with a neutralising weight belt may be worn.

1. Do a snorkel dive to a depth of at least 10m and signal "I AM OK" on surfacing.

Using full scuba equipment and BC.

2. Fin 1000m in open water (800m in the sea) on the surface, breathing through the snorkel only. Candidates should stay in a group if possible and compulsory if the test is being done in the sea.

c. To be carried out in open water under controlled conditions wearing full scuba equipment and BC.

1. Dive to a depth of 40m and demonstrate the following: (Must be done under supervision of the Course Convenor).
2. The ability to signal, receive and interpret 3 CMAS approved diving hand signals;
3. Remove, refit and clear mask once;
4. Remove; replace and purge demand valve once;

9.5.6 ASSESSMENTS

Before granting the qualification the instructor should ensure the student has retained and understood the knowledge required to be a safe CMAS-ISA Three Star Master diver.

The assessment may take the form of a prepared test using "multi-choice" or essay-type questions that allow the coverage of many topics in a short period. Weaknesses that are suggested by the result of this paper can then be investigated by further oral questioning if necessary.

THEORY ASSESSMENT

The assessment format shall be as follows:

Section A	
Short questions on general diving knowledge	20 marks
Section B	
Questions to be divided into sub-questions testing the candidate on advanced medical dining related aspects, treatment of dining incidents, rescue, human performance, fitness and psychology	40 marks
Section C	
Questions to be divided into sub-questions into sub-questions testing the	30 marks

candidate's advanced knowledge and experience with regards to diving physics, basic principles of gas mixture and physiology	
Section D	
Questions to be divided into sub-questions testing the candidate's advanced knowledge and experience with regards to diving related equipment and maintenance	20 marks
Section E	
Questions to be divided into sub-questions testing the candidate's advanced knowledge and experience with regards to dive planning, leadership and decompression tables	30 marks
Section F	
Questions to be divided into sub-questions testing the candidate's advanced knowledge and experience of search and recovery, diving from a boat and underwater navigation	20 marks

Time allowed for the examination is 3 hours – Total marks – 160.

SKILLS ASSESSMENT

The main qualities to be assessed by the instructor will be the student's ability to organise and lead other divers, together with a demonstration of competence in the areas covered by the programme. The Three Star Master diver must be "fully trained" and should therefore not display areas of weakness in the practical performance of diving.

NOTE: All assessments to be conducted by at least one appointed in-date Instructor approved by the Course Convenor.

The dives, as per 9.5.3.9, must be checked and verified by the Course Convenor. All Examiners shall verify and validate all evaluations by signing for them. All practical tests are valid for 1 year before having to redo it for subsequent qualification.