

THE BRITISH SUB AQUA CLUB

TECHNICAL SKILL DEVELOPMENT COURSE

SYLLABUS

SPORTS MIXED GAS DIVER

AIM

A BSAC Sports Mixed Gas Diver is competent to:

- Conduct dives with a dive buddy, within the limitations of the lesser qualified, in conditions already encountered by both during their training or previous experience.
- Conduct dives within BSAC Safe Diving guidelines.
- Dive to a maximum depth limit of 50 metres.
- Conduct such dives with a more experienced or more highly qualified diver to expand their experience of depth or other conditions, within the limits of their mixed gas certification, beyond that previously encountered. Such dives should be under the supervision of a Dive Manager who is ideally an experienced mixed gas diver.
- Conduct dives breathing a gas mixture of oxygen percentage greater than or equal to 20 % and a helium percentage of up to 30 %, for example, 20/30. This mixture contains the maximum permitted percentage of helium gas component for a Sports Mixed Gas Diver, within the prescribed practical tolerances based on the final mixed gas percentages.
- Plan and conduct dives requiring mandatory decompression.
- Rescue another mixed gas diver from depth.
- Conduct dives where other divers, capable of providing assistance and rescue management skills, are available at the surface.

Course Outline

The sport mixed gas diver course consists of the following elements:

- Six classroom lessons
- A theory assessment
- A dry practical lesson of 90 minutes
- One or more confined water lessons of not less than 90 minutes total in-water duration
- Two open water lessons, dependant on student performance, with a total underwater duration of not less than 120 minutes and an individual lesson duration of not less than 45 minutes.
- All practical training in both confined and open water includes the achievement of specific performance standards at appropriate points throughout the lessons.

ENTRY REQUIREMENTS

In order to attend this course, students must comply with the following:

- Be a minimum of 18 years of age
- Hold a minimum diver grade of BSAC Sports Diver (or equivalent with a valid 35 metre depth certification)
- Be able to demonstrate a high level of proficiency in diving. In general terms, this usually entails about

60 logged dives

- Provide logged evidence demonstrating a minimum of 10 dives under different conditions in the range 30 to 35 metres
- Be a BSAC Advanced Nitrox Diver or BSAC Accelerated Decompression Procedures Diver (or equivalent).

A BSAC Extended Range Diver who can demonstrate a minimum of 10 logged extended range dives within the last 2 years, using appropriate equipment, to depths in the region of 40 metres, are required to complete the Physiology and Diving Planning theory lessons. The Instructor who has a lack of knowledge of the student's competence and confidence as an extended range diver, should undertake an open water lesson, to confirm their diving skills, prior to awarding them the Sports Mixed Gas Diver qualification. If the Instructor is confident that the diver has the prerequisite skills, then the Sports Mixed Gas Diver qualification can be awarded based on theory attendance, the open water lesson being discretionary.

Equipment Configuration

For dry practical and confined water training, the following student equipment configuration is assumed:

- Two primary cylinders, total capacity determined by the rule of thirds and personal RMV, suitable for diving to 50 metres
- A single stage cylinder of minimum capacity seven litres. For those students pursuing the Explorer Mixed Gas Diver qualification then it is recommended that they commence their training immediately with two stage cylinders
- Access to an Alternate Supply (AS) demand valve, minimum hose length 1.5 metres
- Mask & fins
- Weight belt or integrated weights where necessary
- Two depth gauges and/or watch/timer and/or decompression computers
- Suitable mixed gas for the lesson
- A delayed surface marker buoy (preferably red) and reel
- An emergency (preferably yellow) delayed surface marker buoy and spare reel
- An additional surface detection aid (e.g. a folding flag)
- Spare mask
- Knife and line cutter
- Slate
- Tag marker for lazy shot/trapeze
- Two torches (primary & backup)
- Buoyancy - two independent rescue solutions
- Trim weights
- Protective clothing as appropriate.

INSTRUCTOR REQUIREMENTS

For classroom based theory presentation lessons, the maximum ratio of students per instructor is driven by the logistical size, comfort and media presentation facilities.

Dry practical lessons - To ensure that the student can fully participate in the exercises and receives effective tuition, the lesson contents assume a ratio of six students per instructor.

For practical lessons, student/instructor ratios should comply with the following guidelines:

Confined water lessons - The confined water lesson notes assume the most likely scenario of the lesson

being carried out in open water, where time constraints are typically not impose.

In order that all students can receive effective tuition during this time, a maximum ratio of four students per instructor is assumed.

In less favourable circumstances, this ratio may need to be reduced appropriate to the water conditions and time available.

Where water conditions allow longer lessons, the above ratios may be increased to a ratio of a maximum of six students per instructor provided that:

- All students can receive effective tuition within the time available
- Underwater visibility is a minimum of 5 metres
- The instructor is of a minimum grade of BSAC Sports Mixed Gas Diver Instructor
- The instructor has the assistance of another diver, minimum qualification Dive Leader and Sports Mixed Gas Diver or equivalent, to monitor the safety and control of students. This safety diver may not teach unless he/she meets the requirements for a BSAC Assistant Sports Mixed Gas Diver Instructor
- The lesson briefing includes clear directions as to the role of the assisting diver during skills instruction.

Open water lessons - Because of the nature of the exercises being taught, the lesson contents assume a ratio of two students to a single instructor or up to four students provided the instructor has the assistance of another diver, minimum qualification Dive Leader and Sports Mixed Gas Diver or equivalent, to monitor the safety and control of students. This is to ensure that each student receives safe effective tuition.

FACILITIES

Suitable classroom with teaching aids for formal presentations. Dry practical area for equipment preparation and dive planning sessions. Suitable confined water dive site (10 metres maximum) for skills development. Dive sites with a maximum depth of 50 metres for the open water dives.

QUALIFICATION

Course certification will be issued by BSAC HQ after the event.

LESSON SYLLABUS

Day 1

Instructor briefing

Course Introduction

- Course outline
- Assessment
- BSAC Sports Mixed Gas Diver
- Course implementation
- Course programme

Theory Lesson Introduction to Mixed Gas Diving

- Sports mixed gas diver certification
- History of recreational mixed gas diving
- What is mixed gas diving?
- Why dive mixed gases?
- Mixed gases
- Issues

Theory Lesson Equipment and Decompression Systems

- Equipment rigging
- Diver configuration
 - Cylinders
 - Gas analysis
 - Regulators
 - Buoyancy
 - Accessories
 - Dive computers
- Decompression systems
 - Lazy shot
 - Back-up stage cylinders
 - Drop cylinders

Dry Practical Lesson Equipment Preparation

Open Water Lesson Confined Water Skills

- **Pre-dive**
- **Briefing**
- **Kit configuration and kit up**
 - **Waterside checks**
 - **Buddy checks**
- **Descent phase**
 - **Bubble and equipment check**
 - **Gas switch**
- **Bottom phase**
 - **Primary gas regulator switch.**
 - **Weighting, trim & buoyancy**
 - **Hovering in a horizontal position**
 - **Helicopter turns**
 - **One metre incremental ascent**
 - **Change to spare mask**
 - **Isolation and shut down procedures**
 - **Stage cylinder ditch and retrieve**
 - **Stage cylinder hand off**
 - **Out of gas response**
- **Ascent phase**
 - **DSMB deployment 2 metres above the seabed**
 - **Switch to decompression gas**
 - **Simulated decompression stop**
 - **Out of travel or decompression gas response**
- **Surface phase**
 - **Hand up stages & exit**
- **Post dive actions**

Theory Lesson Physiology

- Narcosis
- Helium
- Carbon Dioxide Retention
- Fitness
- Oxygen

Theory lesson Dive Planning

- Preparation
- Stress management
- Gas selection
- Dive planning
- PC software - dive examples
- Gas management
- Run time management
- Decompression analysis

Theory lesson Dive Manager Liaison

- Qualifications
- “Duty of Care”
- Dive Manager
- Dive manager’s slate

Day 2

Open water lesson - Open Water Dive

- **Dive planning**
 - **Decompression dive with maximum of 45 minutes ascent time**
 - **Prepare run time slate**
- **Pre-dive**
 - **Equipment preparation**
 - **Waterside checks**
 - **Briefing**
 - **Pre-dive checks**
 - **Visualisation of the dive**
 - **Kit configuration and kit up**
 - **Buddy checks**
- **Descent phase**
 - **Bubble check**
- **Bottom phase**
 - **Weighting, trim & Buoyancy**
 - **Gas switches**
 - **Shut down and Isolation procedure.**
 - **Gas monitoring and management**
 - **Run time management**
- **Ascent**
 - **Run time management**
 - **Mid-water DSMB deployment**
 - **Decompression stops**
 - **Switch to decompression gas**
 - **Stage cylinder hand off**
- **Surface phase**
 - **Hand up stages & exit**
- **Post dive actions**

Open water Assessment - Open Water Dive 2

- **Dive planning**
 - **Decompression dive with maximum of 45 minutes ascent time**
 - **Prepare run time slate**
- **Pre-dive**
 - **Equipment preparation**
 - **Waterside checks**

- **Briefing**
- **Pre-dive checks**
- **Visualisation of the dive**
- **Kit configuration and kit up**
- **Buddy checks**
- **Descent phase**
 - **Bubble check**
- **Bottom phase**
 - **Weighting, trim & Buoyancy**
 - **Gas switches**
 - **Gas monitoring and management**
 - **Run time management**
- **Ascent**
 - **Run time management**
 - **Mode of ascent**
 - **Decompression stops**
 - **Switch to decompression gas**
- **Surface phase**
 - **Hand up stages & exit**
- **Post dive actions**

Knowledge assessment

Open forum and course debrief

Disperse

NOTES

1. Although this is planned as a two day course, it is not necessary to run it over two consecutive days. Students may gain the benefit of time to prepare their equipment and to practice their new mixed gas diving skills. Relevant theory should precede practical training.
2. Instructors should base their teaching on the Sport Mixed Gas Diver Instructor manual. A set of MS PowerPoint Visual aids should be delivered for this course, and they are issued with the Sport Mixed Gas Diver Instructor pack.
3. Suitably qualified BSAC Instructors (or equivalent) who wish to gain the Sport Mixed Gas Diver Instructor status should apply to BSAC Technical Chief Examiner via BSAC HQ.