

## Advanced SCUBA Skills for Scientific Diving (C004276)

**Course size** *(nominal values; actual values may depend on programme)*

**Credits 3.0**      **Study time 84 h**      **Contact hrs**      30.0h

**Course offerings in academic year 2022-2023**

A (semester 1)      English      Gent

**Lecturers in academic year 2022-2023**

Santos, Rui	FAR001	lecturer-in-charge
Padrão, Nuno	FAR001	co-lecturer
Paulo, Diogo	FAR001	co-lecturer

**Offered in the following programmes in 2022-2023**

	<b>crdts</b>	<b>offering</b>
<a href="#">International Master of Science in Marine Biological Resources</a>	3	A

**Teaching languages**

English

**Keywords**

SCUBA, scientific diving, transferable skills

**Position of the course**

This course is designed to train students in advanced SCUBA dive skills, such as stability, team work, problem solving and situational awareness, through well structured dive planning and strong academic knowledge on gas properties and hazards, gas strategies and management, decompression and adequate equipment use for scientific diving activities.

An international certification, according to norm NP EM 14153-02, may be awarded through an additional training module.

**Contents**

The class program will be focused on:

Theory component:

a) Physics and physiology:

- Gas laws
- Gas properties
- Gas Toxicity (O<sub>2</sub>)
- Hipercapnia
- Gas poisoning (CO<sub>2</sub>)
- Narcosis
- Use of Helium

b) Gas management

- Calculating appropriated gas supply and gas types for scientific research
- Calculating adequate gas reserves
- Dive gas and decompression gas
- Gas rule of half's and rule of thirds and its application in to scientific diving

c) Decompression theory

- Bulman algorithm versus VPM for decompression
- Dive computer, dive tables and software
- Minimum decompression profiles
- Emergency decompression
- The use of enriched gases for decompression acceleration

d) Scientific diving planning

- Teams

- Task assignments
- Situation awareness
- Risk assessment

#### e) Scientific Diving SCUBA equipment

Practical application:

- a) Underwater stability (buoyancy mastery, trim, balance)
- b) Propulsion methods adequate for silty and fragile environments (frog, flutter, modified frog, modified flutter, helicopter turn, backward)
- c) Basic manipulation and operation of regulators (including back up) and masks
- d) Underwater tank valve manipulation
- e) Use of safety buoys
- f) Team position and problem solving
- g) Managing out of gas situations
- h) Managing adequate ascend profiles, including minimum decompression while sharing gas to an out of gas diver.
- i) Underwater data acquisition on a pre-set monitoring site.

This class as an entry level prerequisite for students which is to have an Open Water Diver certificate.

If students successfully pass the class, an international certification is awarded.

#### Initial competences

This class has an entry level prerequisite for students which is to have an Open Water Diver certificate or equivalent.

#### Final competences

Students will be able to plan in a safe and efficient manner a dive to collect quantitative data from a pre-set underwater monitoring area.

#### Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

#### Conditions for exam contract

This course unit cannot be taken via an exam contract

#### Teaching methods

Lecture, Fieldwork

#### Extra information on the teaching methods

- The methodology will be theory classes with power point. Theoretical exercises focusing advanced dive planning will be done with all students in an interactive manner.
- Out of the water practice of the future water skills.
- Underwater practice after teacher demonstration.
- Repetition until mastery is obtain.

#### Learning materials and price

Diving courses are not included in the tuition. Students should contact the CCMAR Dive Center (<https://www.ccmar.ualg.pt/page/dive-center>) for information on prices.

#### References

Doing it Right: The Fundamentals of Better Diving, by Jarrod Jablonski (Global Underwater Explorers)  
Scientific Diving Techniques: A Practical Guide for the Research Diver, by J.N. Heine, 225 pages, Best Publishing Company, ISBN 0-941-33269-1

#### Course content-related study coaching

Individual coaching is foreseen for students having problems, and will be on a one to one basis.

#### Assessment moments

end-of-term assessment

#### Examination methods in case of periodic assessment during the first examination period

Report, Written examination

#### Examination methods in case of periodic assessment during the second examination period

Report, Written examination

**Examination methods in case of permanent assessment**

Skills test

**Possibilities of retake in case of permanent assessment**

examination during the second examination period is possible

**Extra information on the examination methods**

Students will be evaluated in terms of performance in the water, in the theory component with a written exam, and in the practical component with a report.

**Calculation of the examination mark**

Students will be evaluated in the theory component with a written exam (20%); and in the practical component with a report (20%). Additionally, a scale from 1 to 4 will be used to evaluate student in water performance (60%) where:

- Unsafe (fail)
- Cannot complete the task (need to repeat)
- Complete the task well (pass)
- Excellent performance (pass)

Retakes are possible; dates for retakes will be arranged between the instructors and the students.