



# CMAS

CONFÉDÉRATION MONDIALE  
DES ACTIVITÉS SUBAQUATIQUES

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WORLD UNDERWATER FEDERATION

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**CMAS Scientific & Sustainability  
Committee**

**Freshwater Biology Course  
(FBC)**

**2018**

The non-professional CMAS Scientific Specialty Courses (SSC) combines the expertise of marine and freshwater scientists, underwater geologists and archaeologists, diving officers, administrators, legislators, individual divers, from different parts of the world scientific diving community. Therefore we revised the last version with the colleagues in the CMAS Scientific & Sustainability Committee (SC) mentioned below, who helped to produce this new standards, and acknowledges the help and advice given by many other people through letters or oral comments.

#### CMAS Scientific & Sustainability Committee, 2018

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# Freshwater Biology Course

Minimum 2 days

6 Theoretical teaching units (TTU)

6 Practical teaching units (PTU)

2-4 dives

## 1.1. Aim of course

- to introduce divers to freshwater life and freshwater sciences
- to increase awareness for freshwater life
- to promote the idea of sustainable diving
- to create multiplications for these ideas and to introduce important freshwater animal and plant groups and their biology
- to increase the everyday personal experience of divers for freshwater ecosystems on the background of better knowledge on the interrelationships of its parts

## 1.2. Student performance objectives

By the end of the course the diver should

- be familiar to the basic biological and limnological processes
- be able to identify important animal and plant groups in the freshwater
- dive sustainably due to his/her more comprehensive understanding of freshwater environment

## 1.3. Prerequisites for participants (minimum requirements)

- age of 14 years
- CMAS \* or equivalent
- valid medical certificate

## 1.4. Instructor/student ratios in open water

- depending on the visibility and diving level

## 1.5. Instructor requirements (see SC administrative text)

- CMAS\*\* diving licence and 100 dives
- academic background in freshwater biology, or
- several years of professional experience in freshwater biology
- teaching abilities
- a high sensibility for sustainable diving

## 1.6. Speciality Course requirements:

- adequate lecture place
- adequate dive site
- identification books for freshwater organisms
- freshwater biology presentation
- freshwater biology scripts or text books

- 1.7. Theoretical teaching units** (the instructor sets thematic emphases)
- general information on the freshwater ecosystems and their organisms
  - an introduction (lakes, ponds, creeks, rivers and their characteristics)
  - zonation and stratification of lakes and rivers
  - annual/seasonal changes in lakes and rivers
  - life cycles of freshwater organisms - plankton, nekton, benthos
  - importance of water (drinking water, aquaculture...)
  - nutrient cycles, food web (production, consumption as processes)
  - biotope-biocoenosis / interrelationships and dependence of the living and non-living
  - anthropogenic impacts on freshwater ecosystems (climate change, acidification, litter)
  - neobiota and invasive species
  - sustainable diving
  - organismal biology (unicellular algae, protozoa, plants, sponges, cnidarians and worms, molluscs, crustaceans, bryozoa insects, fishes, amphibians, freshwater mammals) according the local conditions
- 1.8. Practical teaching units**
- observations and sampling depending on the dive site
- 1.9. Certification**
- control of success by the instructor
  - all divers having successfully completed all components of the course will be issued with the appropriate CMAS Freshwater Biology Speciality Card
  - the brevet is valid permanently

All questions should be addressed to the  
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