



Methods and practical approaches for measuring oxygen consumption in resting and swimming fish

COST FA1304 FitFish PhD-Course:

**Technical University of Denmark, Section for Aquaculture, Hirtshals, Denmark
May 9. – 20. 2016**

Fish physiology is a multidisciplinary area of research that encompasses biomechanics, physiology, ecology, aquaculture and behaviour. Knowledge of respiratory physiology of fishes is relevant for students interested in swimming, behaviour, metabolism, and bioenergetics in fishes in relation to migration, ecology, conservation or aquaculture.

The main topics of the course will be 1) swimming performance of fish, 2) standard and routine metabolism, and 3) activity levels, and how these may be influenced by manipulation of environmental variables.

Students will learn to design and execute experiments within the topics of the course, acquire and analyse video recording of behaviour, how to use swimming tunnels, control a variety of environmental factors, learn the practical aspects of measuring and automatically logging dissolved oxygen in water, and calculating oxygen consumption using commercial or DIY equipment.

The first half of the course will have an emphasis on lectures and explanations of techniques for studying respiratory physiology and behaviour in fish. In the second half of the course, emphasis will be on experimental projects in the laboratory. Groups of 2 - 3 students will pursue independent research projects. These will be discussed between each student and the instructors, who will also suggest a number of relevant projects. Original projects concerning fish physiology, based on the student's personal background and interest, will also be considered. At the end of the course, students will present the results of their independent projects orally and as a written report in the format of a scientific paper. Credits: 5 ECTS. Enrolment is limited to 12 students.

Applications should be submitted before March 31st by e-mail to John Fleng Steffensen. Successful candidates will be notified shortly after. The application should include a short motivation for attending, and relevant information concerning previous fish work experience. Priority will be given to PhD-students affiliated with **FitFish** participants, but other students may be admitted if space permits.

Practical information: Students should arrive at DTU Aqua Monday May 9th no later than midday. Students will be accommodated in double rooms with private bathroom and shower, at the adjacent Motel Nordsøen. Breakfast will be organised by the participants at the motel. All other meals will be served on the premises. The course terminates at the end of Thursday May 19th. Students are expected to leave Friday May 20th. More information, including suggested reading, will be available for the admitted students ultimo February at <http://mbl.ku.dk/JFSteffensen/FitFish>

Fee: The course is financed by FitFish –there is no registration fee.

Transportation: FitFish will reimburse expenses up to 500 Euro, for transportation from home institution to Hirtshals, upon receipt. Accommodation and meals are covered by FitFish

Organisation: The Course is organized in collaboration between **Marine Biological Section at University of Copenhagen** and **Section for Aquaculture at Technical University of Denmark**



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Teachers:

[John Fleng Steffensen](#), Professor
Marine Biological Section, University of Copenhagen, Helsingør, Denmark
JFSteffensen@bio.ku.dk

[Peter V. Skov](#), Associate Professor
DTU-Aqua, Technical University of Denmark, Hirtshals, Denmark
pvsk@aqu.dtu.dk

David J. McKenzie, Senior Researcher
Centre for Marine Biodiversity Exploitation and Conservation, Montpellier, France
David.MCKENZIE@cnsr.fr

Peter G. Bushnell, Professor
Indiana University South Bend
pbushenel@iusb.edu



Section for Aquaculture at DTU is located in the North Sea Science Park (Nordsøen Forskerpark), Willemoesvej 2, 9850 Hirtshals. Accommodation at Motel Nordsøen is right next door.



DTU Aqua
National Institute of Aquatic Resources