UNIVERSITÀ DI PAVIA

Anno Accademico 2017/2018

BIOACOUSTICS

Enrollment year	2016/2017
Academic year	2017/2018
Regulations	DM270
Academic discipline	BIO/05 (ZOOLOGY)
Department	DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES
Course	NATURAL SCIENCES
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	2nd semester (01/03/2018 - 13/06/2018)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	PAVAN GIANNI (titolare) - 6 ECTS
Prerequisites	No prerequisites are necessary, however, as the matter is highly interdisciplinary with an important component related with technology and information technology, it is useful to have an open approach to information of different nature and have an interest to technological aspects. The course is also an opportunity for participation by students in other degree courses such as physics, mathematics, oceanography, and electronic engineering.
Learning outcomes	the course is aimed at providing knowledge about bioacoustics and ecoacoustics; both theory and practical applications. Communication and echolocation in animals, general and environmental acoustics, the impact of anthropogenic noise on animals, operational tools for research and environmental monitoring, issues relating acoustics with nature conservation and management
Course contents	The course aims to increase knowledge on animal behavior, on acoustic

communication and echolocation in both terrestrial and aquatic animals, as well as on environmental noise monitoring systems that can be used both for research purposes and for environmental protection, especially in the field of marine bioacoustics with the studies on marine mammals. We study the systems of acoustic communication in all zoological classes and the echolocation in mammals (bats and cetaceans), outlining the specific scientific problems and the most innovative lines of research. At the conclusion of a classical treatment of bioacoustics, the course examines aspects of acoustic ecology such as acoustic biodiversity, soundscape analysis and anthropogenic noise pollution. The course then addresses the technical issues related to the receipt, recording, analysis and measurement of sound (ranging from infrasound to ultrasound), with particular attention to the most modern digital systems, but without neglecting a historical view of the evolution of the recording and analysis tools. The course ends with the enforcement of bioacoustics such as zoological studies, surveys, environmental monitoring, human-animal interactions, ethofarmacology and neuroscience, robotics, sound pollution. In addition to the lectures, the students will also have the opportunity to use tools to record and analyze the sounds both in the laboratory and in the field.

The course is supplemented by lectures and seminars made by external experts with demonstration of use of advanced tools, both hardware and software.

Teaching methods	lessons with support of slides in powerpoint demonstrations of use of software and tools access to specialist web sites references to the scientific literature in English
Reccomended or required readings	Obrist M.K., Pavan G., Sueur J., Riede K., Llusia D. & Márquez R., 2010. Bioacoustic approaches in biodiversity inventories. In: Manual on Field Recording Techniques and Protocols for All Taxa Biodiversity Inventories, Abc Taxa, Vol. 8: 68-99. The text can be downloaded here: http://www.abctaxa.be/volumes/volume-8-manual-atbi/volumes/volume-8-manual-atbi/chapter-5/Chapter-5.pdf Bradley D.L., Stern R., 2008. Underwater sound and the marine mammal acoustic environment. Guide to fundamental principles. US MMC: 1-67. The text can be downloaded here: http://www.mmc.gov/reports/workshop/pdf/sound_bklet.pdf Other lectures are suggested on the web page at http://www.unipv.it/cibra/edu_book_uk.html
Assessment methods	Oral examination.
Further information	The course deals with a highly interdisciplinary subject that can be of great interest for other degrees students, such as engineers, physicists, oceanographers, mathematicians. Interdisciplinary these are offered.
Sustainable development	

| goals - Agenda 2030 | $lbl_legenda_sviluppo_sostenibile |