

Department of Veterinary Medicine
WILDLIFE MANAGEMENT CONSERVATION AND CONTROL
Academic Year 2026/2027

OPTIONAL COURSES

Teaching activity	Lecturer	SSD	Year	Semester	CFU	Total hours
Population Genetics: Practical Applications in Marine Zoology	Azzena	BIOS-03/A	1	I	4	32
GIS Applications in Wildlife Management	Chirichella	BIOS-03/A	1	I	4	32
Wildlife Research for Conservation and Management	Brogi	BIOS-03/A	1	I	2	16
Wildlife Anaesthesia and Restraint Basics	Columbano	MVET-05/A	1	I	2	16
Aliens and island endemics	Lecis	BIOS-03/A	1	II	2	16
Food Safety and Hygienic Management of Game Meat Production Chain	Piras	MVET-02/B	1	II	4	32
Wildlife First Aid and Emergency Management	Crovace	MVET-05/A	1	II	2	16
Cetacean Ecology, Monitoring and Conservation	Pintore	BIOS-03/A	1	II	4	32
Conservation and Genetic Monitoring of Wild Predators	Galaverni	BIOS-03/A	2	I	2	16
Genomic Data Analysis for Conservation and Risk Assessment	Iacolina	BIOS-03/A	2	I	4	32
Nutrition and Nutritional Management of Marine Mammals	Cappai	AGRI-09/B	2	I	2	16

TO SELECT YOUR PREFERENCES

PLEASE FILL IN THE ONLINE FORM AT THIS LINK:

<https://forms.gle/B9PKDudhohvYbZbL7>

Course: POPULATION GENETICS: PRACTICAL APPLICATIONS IN MARINE ZOOLOGY

Lecturer: ILENIA AZZENA

ECTS credits: 4

Hours: 32 (16 theory + 16 practice)

Year: 1

Semester: 1st

Delivery mode: ONLINE

Outline:

The main goal of the course is to demonstrate how modern molecular techniques have provided fresh insights into understanding the biodiversity of marine life and its conservation. This objective will be achieved through the presentation of advanced concepts and specific case studies carried out by the Professor's research group. At the end of the course, students will have acquired knowledge and understanding of the issues related to the evaluation and conservation of aquatic fauna, with particular emphasis on population genetics and conservation issues. In particular, students will be able to understand the applications of population genetics through case studies involving marine species of conservation interest as well as invasive alien species (IAS).

Prerequisites:

Fundamentals of genetics.

Lectures:

- Introduction to conservation issues of aquatic fauna.
- Principles of population genetics and conservation applied to marine zoology.
- Importance of population genetics in the study of evolution and genetic variability in marine habitats.
- Overview of the main evolutionary processes and factors shaping the genetic structure of marine animal populations.
- Main laboratory techniques of genetics applied to marine organisms.
- Introduction to methods of molecular data analysis applied to marine vertebrates and invertebrates used in a genetics laboratory.

Practical Lessons:

- Building a dataset (use of online databases; preparation of newly obtained sequences; how to label the sequences);
- Sequence alignment;
- How to calculate divergence estimates using DNAsp;
- How to build a network (network analysis).

For the 16 hours of practical lessons, the use of a personal laptop is required. The analysis software will be provided by the Professor.

Teaching Methods:

Lectures and practical activity [ONLINE].

Methods of Learning Assessment:

The exam will be conducted orally.

Students will be required to prepare a PowerPoint presentation on a case study relevant to the course (10 minutes). The students will have to answer 2 questions on topics covered during the course.

The assessment will be based on both content and the use of appropriate scientific language.

Assessment Criteria:

→ Quality of Content (max 11 points)

- 0-3 points: Inaccurate or incomplete content, with conceptual errors.
- 4-7 points: Correct content but lacking depth, with some inaccuracies.
- 8-10 points: Accurate and well-developed content, with detailed information.
- 11 points: Excellent, well-structured content, without errors and with appropriate references.

→ Depth and Originality of the Presentation (max 11 points)

- 0-3 points: No depth, generic presentation lacking originality.
- 4-7 points: Some depth, but not very incisive or particularly original.
- 8-10 points: Good depth with interesting and personal insights.
- 11 points: Significant and original depth, demonstrating critical thinking.

→ Use of Appropriate Scientific Language (max 11 points)

- 0-3 points: Unclear language, with improper or inadequate terms.
- 4-7 points: Comprehensible language but with some errors or inaccuracies.
- 8-10 points: Correct language, with good use of scientific terminology.
- 11 points: Rigorous, precise language, perfectly suited to the scientific context.

→ Awarding of Distinction

Distinction is awarded for a score between 31 and 33.

To achieve distinction, the student must excel in at least two criteria and score no less than 10 in any of them.

Reference Texts:

Educational material used for presentations; other material used during lectures and practical lessons.

Contact Information

E-mail: iazzena@uniss.it

Course: GIS APPLICATIONS IN WILDLIFE MANAGEMENT

Lecturer: ROBERTA CHIRICHELLA

ECTS credits: 4

Hours: 32

Year: 1

Semester: 1st

Delivery mode: ONLINE

Outline

The aim of the course is to provide theoretical and practical knowledge for an efficient and conscious use of modern digital cartography tools (Geographic Information Systems) in wildlife management and conservation of natural resources. As an example, in this context, a GIS enables to manage spatial data on wildlife distribution and density, movements and habitat use patterns, and environmental variables (climate, landcover, etc.). Data can be mapped and analysed, which can provide valuable information for the development of management strategies.

The theoretical foundations on which digital cartography is based will be provided, to initiate the student to use GIS technologies to real problems, with particular reference to the use of vector and raster data in contexts connected to management and conservation biology. Theoretical lessons and examples of the use of GIS will be alternated to practical exercises for managing, analyzing, and visualizing wildlife data.

Teaching methods

The course has a theoretical-practical nature and alternates theoretical presentations and training sessions on the software QGIS, a user-friendly Open Source GIS licensed under the GNU General Public License. [ONLINE]

Verification of learning

The student will be provided with a set of data and a question concerning the wildlife management before taking the exam. The student will solve the question throughout the use of QGIS software and explain in a short report or presentation the steps she/he used to answer the questions. The final test is an oral examination. The student will answer and elaborate on some questions, starting from his/her report or presentation.

Teaching materials

The slides and supplementary materials used for lectures and practice will be shared with the students on e-learning platform.

Books for further information:

- DeMers M.N., 2008. Fundamentals of Geographical Information Systems, 4th Edition. John Wiley & Sons.
- Bolstad P., 2016. GIS Fundamentals: A First Text on Geographic Information Systems. 5th edition. XanEdu.
- Heywood D.I., Cornelius S.C., Carver S.J., 2011. An Introduction to Geographical Information Systems. 5th edition. Pearson Prentice Hall.

Contact Information

E-mail: rchirichella@uniss.it

Course: WILDLIFE RESEARCH FOR CONSERVATION AND MANAGEMENT

Lecturer: RUDY BROGI

ECTS credits: 2

Hours: 16

Year: 1

Semester: 1th

Delivery mode: ONLINE

Outline

Effective wildlife management and conservation rely on scientific knowledge about wildlife, which is primarily obtained through wildlife research. Understanding how research works, how data are collected, analysed, and transformed into scientific knowledge is essential for future wildlife managers.

This course combines theoretical lessons with case studies to familiarize students with the general workflow of wildlife scientific research and its relevance to wildlife management and conservation. The course will cover the following topics:

- Scientific research and its terminology: key concepts such as assumptions, theories, hypotheses, and predictions, and why they matter
- From research to management and conservation: case studies of research applied to management and sources of existing scientific knowledge

- Study design and research workflow: defining research questions, data collection and analysis, interpretation of results
- Wildlife research tools, their pros and cons, why and when to use them: direct observations, biological sampling, camera trapping, behavioural testing, bio-tracking, and integrative approaches
- Data analysis and modelling

Teaching methods

The course has a theoretical nature and will be held online.

Verification of learning

The final assessment will include a written test on the course content and the design and presentation of a wildlife research project

Teaching materials

The slides and supplementary materials used for lectures and practice will be shared with the students.

Contact Information

E-mail:

rbrogi@uniss.it

Course: **WILDLIFE ANAESTHESIA AND RESTRAINT BASICS**

Professor: NICCOLO' COLUMBANO

ECTS credits: 2

Hours: 16 (8 theory + 8 practice)

Year: 1

Semester: 2nd

Delivery mode: IN PERSON

Outline

Objectives

- Provide an overview of comparative physiology (mammals, birds, reptiles) relevant to anaesthesia.
- Introduce a simplified pre-anaesthetic assessment for non-veterinary personnel.
- Demonstrate basic physical and chemical restraint techniques suitable for wildlife.

Content

- Comparative Physiology Essentials
 - Key differences in cardiovascular, respiratory, and thermoregulatory systems among mammals, birds, and reptiles.
 - How those differences affect anaesthetic planning.
- Pre-Anaesthetic Assessment
 - Basic vital signs (heart rate, respiratory rate, temperature) and body condition assessment.
 - Recognizing high-risk conditions in wildlife (e.g., trauma, dehydration).
- Physical Restraint Techniques
 - Safe capture methods (nets, cloths, boxes) for common species.
 - Minimizing stress and preventing injury to animal and handler.
- Chemical Restraint Overview
 - Common sedative/tranquillizer classes (e.g., benzodiazepines, dissociatives) at a basic level.

- Routes of administration (hand injection, pole syringe) and simple dose calculation (weight × standard dose).

Practical Activities

- Physical Restraint Exercises
 - Hands-on practice with models or non-veterinary surrogate species (e.g., rabbits, chickens).
 - Techniques for secure handling, head and limb control, and use of simple tools (nets, towels).
- Chemical Restraint Simulation
 - Drawing up and loading syringes using mock drug vials.
 - Simulated dart gun or pole syringe use on a non-live target.
- Case Discussion
 - Example scenario: sedating an injured raptor for transport.
 - Group discussion of protocol steps, safety measures, and potential complications.

Prerequisites

Basic animal biology knowledge (e.g., introductory courses in animal anatomy and physiology).

Teaching Methods

Lecture presentations, group discussions, hands-on simulations using models and non-veterinary surrogates.

Verification of learning

Evaluation Criteria

- Participation and Attendance
- Written Quiz or oral examination (short-answer questions on physiology and restraint basics)
- Practical Skills Assessment (demonstration of safe physical restraint and simulated drug administration).

Teaching materials

Course handouts, summary protocols, demonstration equipment (nets, syringes, bandages), and neonatal manikins.

Contact Information

E-mail: ncolumbano@uniss.it

Course: ALIENS AND ISLAND ENDEMICIS

Lecturer: ROBERTA LECIS

ECTS credits: 2

Hours: 16 (8 theory + 8 practice)

Year: 1

Semester: 2nd

Delivery mode: IN PERSON

Outline

Alien and invasive animal species as a threat for biodiversity conservation.

Alien species detection and spread monitoring techniques. Ecological, genetic and sanitary implications.

Invasive alien species (IAS) regulation and management. Case studies on terrestrial vertebrates.

Island endemic species: main threats and implications for conservation. The case of Sardinia.

Genetic and one-health aspects in the conservation of native endemic taxa. Case studies.

Bats in Sardinia (Practice/Field work)

Teaching Methods

The course has a theoretical-practical nature and combines theoretical lectures and practice in the field.

Verification of learning

The final exam will consist in a written test on the content of the course and a ppt presentation on a topic of choice.

Teaching materials

The slides and supplementary materials used for lectures and practice will be shared with the students on e-learning platform.

Contact Information

E-mail: rlecis@uniss.it

Course: FOOD SAFETY AND HYGIENIC MANAGEMENT OF GAME MEAT PRODUCTION CHAIN

Professor: FRANCESCA PIRAS

ECTS credits: 4

Hours: 32 (24 theory + 8 practice)

Year: 1

Semester: 2nd

Delivery mode: IN PERSON

Outline

The student attending the course develops the study and knowledge of:

- Control and hygienic management of game hunted and farmed meat;
- Slaughtering technology;
- Biological and abiotic hazards related to hygienic management of game meat;
- Hygienic management of production processes;
- Methods, techniques and analytical criteria for evaluation of meat hygiene, safety and quality;
- National and of the European Union regulatory requirements related to game meat hygiene and animal protection.

Contents

- Structural, operational and hygiene requirements of game-handling establishment, including assessment of their compliance with regulatory requirements.
- Slaughtering procedures
- Hygienic management of slaughtering operations and environments
- Basic knowledge about hygiene and food safety of hunted wild game and farmed game meat: game meat microbiology
- Emerging microbiological hazards (including zoonosis) and specific hazards (zoonosis) in game meat
- Official controls for game meat
- The role of the “trained person” and of the food safety operator
- National and of the European Union regulatory requirements related to game meat hygiene
- National and of the European Union regulatory requirements related to animal protection during transport (farmed game) and during killing and related operations (farmed and hunted game)

- Transport, storing and refrigeration management of game meat
- Health mark and identification mark
- Management of game animals by products
- Regulatory requirements related to game meat marketing and sales

Practical teaching activity will include:

- elements of basic food microbiology;
- evaluation of the chemical-physical parameters of hunted game meat;
- evaluation of the quality of hunted game meat in relation to colour.

Teaching Methods

Lectures, problem solving, case-studies and in itinere verifications

Laboratory practical activities and sampling session simulations

Verification of learning

The final exam will consist in a written test on the content of the course.

Teaching materials

Presentations and slideshow

Contact Information

E-mail: fpiras1@uniss.it

Course: **WILDLIFE FIRST AID AND EMERGENCY MANAGEMENT**

Professor: ALBERTO CROVACE

ECTS credits: 2

Hours: 16 (8 theory + 8 practice)

Year: 1

Semester: 2nd

Delivery mode: IN PERSON

Outline

Objectives

- Teach basic triage and stabilization for trauma and shock in wildlife.
- Provide protocols for managing acute conditions: haemorrhage control, heatstroke, simple wound care.
- Introduce fundamental neonatal resuscitation techniques for orphaned or injured neonates.

Contents

- Triage and Initial Assessment
 - Simplified “ABC” approach: Airway, Breathing, Circulation for wildlife.
 - Identifying critical cases: major bleeding, respiratory distress.
- Trauma and Basic Haemorrhage Control
 - Types of injuries (e.g., fractures, lacerations) in wildlife.
 - Techniques: direct pressure, improvised pressure bandages, makeshift splints.
- Heatstroke and Shock Management
 - Recognizing hyperthermia in birds and reptiles.
 - Rapid cooling methods: misting, fan use, shade.
- Neonatal Basic Resuscitation

- Recognizing neonatal distress (e.g., weak breathing, hypothermia).
- Clearing airways, gentle stimulation, and warming techniques.

Practical Activities

- Haemorrhage Control Drills
 - Practice bandaging techniques on models with simulated bleeding.
 - Improvised tourniquet placement using ropes or cloth.
- Heatstroke Response Workshop
 - Setting up a rapid cooling station (spray bottles, fans) and monitoring temperature with infrared thermometers.
 - Managing a mock hyperthermic reptile or bird model.
- Neonatal Resuscitation Practice
 - Using neonatal manikins: clearing airway, chest compressions, mouth-to-snout ventilation.
 - Simulated feeding and warming of an orphaned mammal neonate (e.g., small rodent model).

Prerequisites:

Basic animal biology knowledge (e.g., introductory courses in anatomy and physiology).

Teaching Methods:

Lecture presentations, group discussions, hands-on simulations using models and non-veterinary surrogates.

Verification of learning

Evaluation Criteria:

- Participation and Attendance
- Written Quiz or Oral Examination (scenario-based questions on trauma, bleeding control, and neonatal care)
- Practical Skills Assessment (demonstration of haemorrhage bandaging, heatstroke protocol, or neonatal resuscitation).

Teaching materials

Course handouts, summary protocols, demonstration equipment (nets, syringes, bandages), and neonatal manikins.

Contact Information

E-mail: a.crovace@icloud.com

Course: CETACEAN ECOLOGY, MONITORING AND CONSERVATION

Lecturer: LAURA PINTORE

ECTS credits: 4

Hours: 32

Year: 1

Semester: 2nd

Delivery mode: ONLINE

Outline

Cetaceans represent one of the most charismatic and ecologically important groups of marine vertebrates. As top predators and key components of marine ecosystems, they play a crucial role in maintaining the health and balance of oceanic food webs. However, many cetacean populations are currently threatened by a wide range of anthropogenic pressures, including ship traffic, fisheries interactions, underwater noise pollution and climate

change.

Understanding cetacean biology, behaviour and ecology is therefore essential for wildlife managers and conservation practitioners working in marine environments. Scientific monitoring of cetaceans has become a fundamental tool for informing conservation strategies, identifying critical habitats and supporting marine spatial planning.

The course introduces the diversity, biology and conservation of cetaceans, with particular focus on the Mediterranean Sea. Students will first explore the diversity of cetaceans, distinguishing between odontocetes and mysticetes and learning to recognise both resident and occasional species occurring in the Mediterranean basin.

The biological aspects of cetaceans will then be discussed, including:

- anatomical adaptations to aquatic life
- evolutionary transition from terrestrial mammals
- acoustic communication and bioacoustics
- behavioural ecology and social behaviour

A dedicated part of the course will focus on the conservation of cetaceans and the main threats affecting their populations, such as fisheries interactions, ship strikes, pollution and underwater noise. Possible conservation strategies and mitigation measures will be discussed, highlighting the importance of scientific research and monitoring programmes.

Students will also be introduced to the main research methods used in cetacean studies. Particular attention will be given to field observation techniques and the importance of standardized data collection during monitoring activities, including:

- visual surveys and species identification at sea
- use of field equipment and navigation tools
- data recording through field data sheets and monitoring protocols

The course will also introduce two widely used research techniques in marine mammal science:

- photo-identification, used to recognise individual cetaceans through dorsal fin morphology and natural marks
- behavioural monitoring, including the use of ethograms and behavioural analysis tools such as the BORIS software

Finally, the course will explore the role of ecotourism and citizen science in marine conservation. The historical transition from commercial whaling to whale watching will be discussed, together with the development of whale watching in the Mediterranean Sea. Particular attention will be given to responsible whale watching practices, the High Quality Whale Watching (HQWW) certification and the importance of conservation areas such as the Pelagos Sanctuary for Mediterranean Marine Mammals. The citizen science project Le Vele del Panda will be presented as a case study illustrating how monitoring activities can contribute to cetacean conservation.

Prerequisites:

None

Teaching Methods:

The course has a theoretical nature and will be delivered online. Lectures will be complemented by case studies and practical exercises introducing students to monitoring techniques and research tools used in cetacean studies.

Verification of learning

The final assessment will include a written test on the course content and a short assignment focused on the design of a cetacean monitoring activity or conservation initiative.

Teaching materials

Lecture slides, scientific articles and supplementary materials used during the course will be shared with the students.

Contact Information

E-mail: laura.pintore92@gmail.com

Course: CONSERVATION AND GENETIC MONITORING OF WILD PREDATORS

Lecturer: MARCO GALAVERNI

ECTS credits: 2

Hours: 16

Year: 2

Semester: 1st

Delivery mode: IN PERSON / ONLINE

Outline

Wild predators are among the most endangered species due to their apex role in the food web, reflecting the overall biodiversity loss the Earth is currently experiencing at an unprecedented rate in the last millennia, and often to direct human persecution. Moreover, they are mostly elusive and distributed across large home ranges at low densities. Therefore, urgent conservation actions are often required, although classical field methods require extensive effort to gather information on presence/absence of the species and are often ineffective in obtaining detailed information. Genetic monitoring, starting from almost any biological material, even from non-invasive sources and environmental DNA, can provide excellent tools to monitor wild predator species to serve as a basis for conservation programs.

In this course, theoretical lessons will be followed by case studies and state-of-the art papers to instruct the students with the general background on the conservation of wild predators, genetic monitoring techniques and the type of data they can provide, starting from sampling design and sources of biological materials, selection of markers, analysis pipelines and evaluation of results, including those derived from genome-wide data. In particular, we will see these steps applied to the study and conservation of some of the most iconic Italian predator species, such as wolf, brown bear, wildcat and birds of prey.

Teaching Methods

The course has a theoretical nature and will be held online. [ONLINE]

Verification of learning

The final exam will consist in a written test on the content of the course and a case-study presentation.

Teaching materials

The slides and supplementary materials used for lectures and practice will be shared with the students.

Contact Information

E-mail: m.galaverni@wwf.it

Course: GENOMIC DATA ANALYSIS FOR CONSERVATION AND RISK ASSESSMENT

Professor: LAURA

IACOLINA

ECTS credits: 4

Hours: 32 (8 theory + 24 practice)

Year: 2

Semester: 1st

Delivery mode: IN PERSON

Outline

The course relies on the theoretical knowledge acquired during the “Animal Conservation Genetics” course. The main concepts will be presented, and students will learn how to perform bioinformatic analysis on genome wide SNPs data to investigate population and conservation aspects (e.g. hybridization, inbreeding), connectivity and adaptation (in a risk assessment perspective). Through hands-on sessions, students will acquire basic bioinformatic skills, how to organize the workflow to answer biological questions, how to interpret results and present them in a structured manner.

The combination of theoretical knowledge and data analysis will strengthen the students’ critical interpretation of genetic\genomic information and support their management or conservation planning.

Teaching Methods

The course has a theoretical-practical nature and alternates brief theoretical presentations and training sessions using free software on personal computers. [IN PERSON]

Verification of learning

The final exam will consist of a short project work where students will analyse and interpret, based on provided guiding questions, the results from a given dataset.

Teaching materials

The slides and written instructions for data analysis will be shared with the students.

Contact Information

E-mail: liacolina@uniss.it

Course: NUTRITION AND NUTRITIONAL MANAGEMENT OF MARINE MAMMALS

Professor: Maria Grazia Cappai

ECTS credits: 2

Hours: 16 (theory)

Year: 2

Semester: 1st

Delivery mode: IN PERSON/ONLINE

Outline

The main goal of the course is to let the student aware of the nutritional aspects of marine mammals, with specific regard to selection, absorption and digestion of localized food items in the natural marine environment. Importance will be given to the ecological role of the feeding habits of different marine mammals and how those integrate with different habitats. The course is based on presentation of advanced concepts and specific case studies. At the end of the course, students will have acquired knowledge and understanding of the issues related to the evaluation nutritional aspects and to some extent of nutritional management. Students will be able to understand the applications of nutritional concepts applied to marine mammals and the interaction with other animals and feeding sources.

Contents

Lectures:

- Introduction to nutritional aspects of marine mammals.
- Principles of nutrition applied to marine nutrition of mammals.

- Importance of nutritional diversity and feeding strategies in marine habitats.
- Overview of the main evolutionary processes and factors related to the localization, choice, intake and nutritional meaning of marine feeding sources
- Aspect of nutritional management of some marine mammals in captive conditions.

Teaching Methods

Lectures will be given [IN PERSON]

Verification of learning

Students will be required to answer multiple choice written text by the end of the course and to present a case animal study with appropriate scientific language.

Teaching materials

Educational material used for presentations; other material used during lectures and practical lessons. (shared on Moodle/Teams).

Contact Information

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