INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Management and Restoration of Aquatic and Riverside Ecosystems			Field of study	Forestry & Hunting	
Master in	Management of Forest Resources			School	School of Agriculture	
Academic Year	2023/2024	Year of study	1	Level	2-1	ECTS credits	6.0
Type	Semestral	Semester	2	Code	6363-808-1203-00-23	

Workload (hours)	162	Contact hours	T	-	TP	-	PL	-	TC	-	S	-	E	-	OT	-	O	-

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s)	Amilcar António Teiga Teixeira

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Learning Outcomes (1): To know the abiotic and biotic components of the freshwater ecosystems and the main typology of running waters and reservoirs systems;
2. Learning Outcomes (2): To understand the function and ecological processes and the effects of different human activities on the freshwater ecosystems;
3. Learning Outcomes (3): To apply different methodologies in habitat and fish assessments and plan the management of fishery stocks;
4. Learning Outcomes (4): To define mitigation actions and to promote the recovery of disturbed systems;
5. Learning Outcomes (5): To know the legal and administrative aspects of inland fisheries management in Portugal and the tools of fishery management
6. Competences (1): capacity to analyse physical, chemical and biological data and be able to apply different methodologies in order to mitigate disturbance effects;
7. Competences (2): to make management decisions concerning anglers activities and management needs of angling sites and fish populations.

Prerequisites

Before the course unit the learner is expected to be able to:
Knowledge about aquatic ecology

Course contents

Basic concepts of aquatic ecology. Freshwater communities. Habitat and Fish population assessment: Sampling tecnhiques. Ecological management of lotic and lentic environments. Riparian restoration tecnhiques. Management of fish populations and habitat. Management and exploitation plans of fish populations. Social and economical analyses and benefits. National and EU Legislation.

Course contents (extended version)

1. THEORETICAL PROGRAM
   - INTRODUCTION: Aquatic and riparian environments. Ecosystem services;
   - BIODIVERSITY: Bioecology of microorganisms, primary producers, invertebrates and fish.
   - ECOSYSTEMS: Typology and functioning. Spatial, temporal and trophic variations.
   - IMPACTS: Pollution, regulation, invasive alien species, riparian degradation. Climate change;
   - MONITORING: Sampling of fish fauna and aquatic and riparian habitat assessment. Biotic integrity.
   - CONSERVATION: in situ and ex situ for the conservation of species and habitats. Mitigation
   - MANAGEMENT: Fisheries management. Control of invasive species. Restocking and stock manipulation
   - RESTORATION: Natural engineering techniques applied to the riparian restoration. Study cases
   - WATER LEGISLATION: National and international water legislation. Fishing regulation. Socioeconomics
2. PRACTICAL PROGRAM
   - Field and laboratory works: Assessment of fish populations; River and riparian restoration

Recommended reading

1. Dudgeon D. (2020). Freshwater biodiversity. Status, Threats and Conservation. Cambridge; New York, NY: Cambridge University Press.
2. Cowx I.G. (1994). Rehabilitation of freshwater fisheries. Fishing News Books. Oxford.
3. Murphy, B. R. & Willis, D. W. (1996). Fisheries Techniques. American Fisheries Society. Bethesda, Maryland, USA.
4. Pokrovsky O.S. (2016). Riparian Zones: Characteristics, Management Practices and Ecological Impacts (Environmental Research Advances) Nova Science Pub Inc; UK ed. Edition.
5. Francis R. A. (2017). A Handbook of Global Freshwater Invasive Species. Earthscan

Teaching and learning methods

Lessons 1) Lectures: sessions will use audiovisual media resources. laboratory classes- a) field work based on specific methodologies. b) Laboratorial- identification, data treatment and analyses. 2) Tutorial – practical works started during lectures; Investigation and group works (seminar); library research (B-on).

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
   - Presentations - 30%
   - Work Discussion - 20%
   - Final Written Exam - 50%
2. Alternative 2 - (Regular, Student Worker) (Supplementary)
   - Final Written Exam - 100%
3. Alternative 3 - (Student Worker) (Special)
   - Final Written Exam - 100%

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

Amilcar António Teiga Teixeira	Tomás de Aquino Freitas Rosa Figueiredo	Felícia Maria Silva Fonseca	Maria Sameiro Ferreira Patrício
17-01-2024	17-01-2024	17-01-2024	17-01-2024