

COURSE

Innovative Approaches for Invertebrate Biodiversity Monitoring

SSD: AGRI-05/A

PHD COURSE: SUSTAINABLE AGRICULTURAL AND FORESTRY SYSTEMS AND FOOD SECURITY

ACADEMIC YEAR: 2025/2026

COURSE DESCRIPTION

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GENERAL INFORMATION

SUGGESTED YEAR: I, II

PERIOD: from 1st of March to end of April

(indicate at least the month)

CFU: 6

EXPECTED OUTCOMES

Invertebrates, especially insects, play a fundamental role in ecosystems, contributing to essential ecosystem services such as pollination, nutrient cycling, and pest control. Their diversity and abundance make them key indicators of environmental health, highlighting the importance of effective monitoring methodologies.

This course will provide PhD students with both a solid theoretical background and practical skills through hands-on activities. Participants will explore innovative technologies for invertebrate biodiversity monitoring, including DNA-based and image-based approaches, with applications in functional ecology, conservation biology, and agriculture. The course will cover different environments, from terrestrial and freshwater ecosystems to semi-natural landscapes and agroecosystems, offering a comprehensive perspective on invertebrate biodiversity assessment.

CONTENTS/SYLLABUS

1. Course introduction
2. Generalities on biological and ecological concepts
3. Traditional methods for invertebrates (especially insects) monitoring
4. Innovative methods and technologies for invertebrates (especially insects) monitoring
5. Focus on environmental DNA-based monitoring (theoretical background and hands-on activities)
6. Biodiversity data analyses
7. Designing monitoring activities (define monitoring targets, outline monitoring schemes, select appropriate technologies)

READINGS/BIBLIOGRAFY

Selected scientific papers provided by the teacher, scripts, and tutorials

TEACHING METHODS

Lectures	hours: 8
Laboratory	hours: 26
Seminars	hours: 8
Other activities	hours:

EVALUATION CRITERIA

a) Methods for acquiring eligibility

X Project discussion

b) Evaluation pattern

For eligibility, a percentage of attendance of the course of at least 70 % is required.