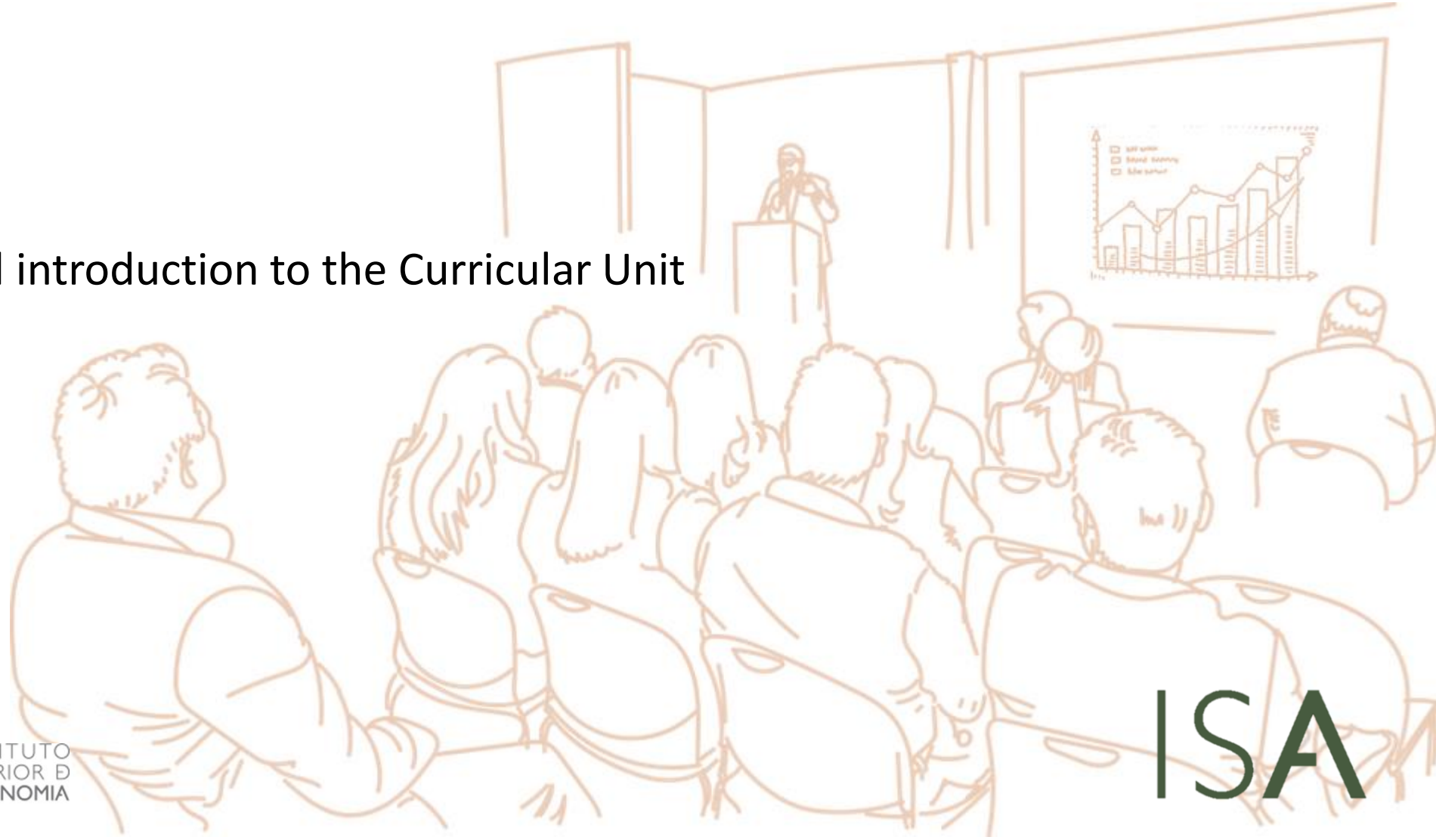
Data Science Seminar

Lesson 01

- Welcome and introduction to the Curricular Unit



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INSTITUTO SUPERIOR DE AGRONOMIA

ISA

- *Why Data Science Seminar?*
- *What and how will I learn?*
- *How will I be assessed?*
- *Calendar*
- *Types of thesis*
- *Thesis themes and supervisors*

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Why Data Science Seminar?

a) To help the student to **plan** and **organize ideas** on the thesis topic.

b) To help students to shape their topic and work plan under a **data science perspective**.

c) To help the student to succinctly and clearly **present the main ideas** of the thesis, including the use of advanced data visualization techniques.

d) To help the student to acquire oral and interaction skills for a more **effective collaboration**.

e) To inform the student about the best practices for **acquiring**, **sharing**, **using** and **analyzing information**, as well as the **ethical aspects** of using information.

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What and how will I learn?

- Learn the best practices of formal and informal planning of a thesis, (including the importance having contingency plans);
- Learn how to structure a thesis dissertation/report
- Provide the student with pointers on presentation skills;
- Prepare summarized presentations of the Data Science application case to be developed in the master's thesis;
- Discuss positive and negative points of each presentation, involving both the lecturers and the students;
- Provide feedback and recommendations to the students.

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How will I be assessed?

Two assessment based on seminar presentations:

1. An internal presentation of the thesis plans with feedback from the colleagues and evaluation by the lecturer (40%).

2. Presentation of the thesis progress – evaluation by a jury made up of two core lecturers and one guest researcher related to each topic of the thesis, either from ISA or a partner institution (60%).

Mainly intended to help students clear up ideas on the topic of their thesis and an opportunity to assess the progress of sudent’s thesis.

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Calendar

Class	Date	Contents summary
1	26 sep	Welcome. Objectives, programme, calendar and assessment. Types of MSc thesis. Thesis themes and supervisors.
2	17 oct, Zoom	Update of MSc topics. Best practices of formal and informal planning. Structuring a Data Science publication/thesis/report.
3	31 oct	Best practices of Data Science presentations. Talks from former GreenDS students.
4	7 nov	Artificial Intelligence tools to support bibliographic research (Dr. Maria do Rosário Fernandes, BISA). Talks from former GreenDS students.
5	21 nov	Presentations of the thesis plans
Final Seminar	jan-feb	Presentations of the thesis progress

Open MSc classes organized by the Food Science Department

Day	Hour	Room	Topic	Lecturer
2	11.00 - 12.45		Organização geral da tese - principais capítulos e o seu conteúdo	SS
9	14.00 - 15.45		Estratégias de pesquisa e revisão bibliográfica	JC
16	11.00 - 12.45		Vantagens dos gestores de referências bibliográficas - Criação da biblioteca pessoal & referenciação automática	SS & JC
23	14.00 - 15.45		A importância de comparar resultados com a literatura + Como preparar a defesa da tese de mestrado	SS
30	11.00 - 12.45		Ferramentas de Inteligência Artificial no apoio à pesquisa bibliográfica	Rosário Fernandes, BISA

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Types of thesis

- **Dissertation** – the most traditional format of an academic work
- **Project work** – may either result from:
  a) A research project designed and implemented by the candidate
  b) A technical project involving a technical solution to a practical problem in which the candidate applies scientific knowledge in the area of the master's degree in question
- **Internship report** - must contain a description and scientific and critical analysis of the activities carried out as part of a professional internship in an institution/company relevant to the scientific field of the study cycle. The internship must involve a minimum of 800 hours of effective work.

Check the “Regulation for ISA master's programmes” for more details

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Thesis themes and supervisors

Name	Topic	Status
Alícia Gouveia	Applications of Data Science on Biodiversity: GBIF and invasive species	±
Ana Moreira		
Damião de Goes		
Diogo Simão		
Dominic Welsh	Continuous change detection algorithm for Portugal land use changes	✓
Emmanuel Rivera	Remote detection to monitor rice growth in mangrove swamp rice crops	✓
Inês Schwartz	Database development with applications on soil microbiology	✓
Maria Dolgaya	Internship task: Mapping material stocks in buildings and modelling construction waste flows for a circular built environment	✓
Mariana Coelho	Predicting adaptations of orchids to climate change	✓
Maria Navalho		
Miguel Ferreira		
Rafael Rodrigues	Digital technologies in olive farming	✓
Rubén Torrado		
Sofia Rodrigues		

✓ Defined

± Under progress

✗ Not defined

Thesis themes and supervisors

THEME 1

Area: Agriculture Sciences

Title: Evaluation of the usability of different data sources and different indices in monitoring agricultural droughts

Thesis type: Dissertation

Institution/company; project name: ISA

Supervisors: Ana Russo (ISA), Paula Paredes (LEAF, ISA)

Main objectives:

- Compiling meteorological data from various sources and assessing its reliability
- Evaluate the usability of this data for calculating various existing drought indices

Thesis themes and supervisors

THEME 2

Area: Food sciences

Title: Identification of biomarkers based on statistical analysis of OMIC methodologies applied to traditional Portuguese cheeses

Thesis type: Dissertation

Institution/company; project name: ISA

Supervisors: Andre Almeida (ISA), Teresa Semedo (FMV, UL)

Main objectives:

Analyze metagenomic, proteomic, lipidomic and volatilomic data from the study of Traditional Portuguese Cheeses with Protected Designation of Origin, with the aim of identifying eco-specific biomarkers

Thesis themes and supervisors

THEME 3

Area: Forestry Sciences

Title: Multitemporal approach to monitor Riparian forest changes through UAV remote sensing

Thesis type: Dissertation

Institution/company; project name: ISA

Supervisors: Patricia Rodriguez Gonzalez (ISA), Juan Guerra Hernandez (ISA)

Main objectives:

In this thesis the student will analyze forest changes and assess forest decline using a combination of high resolution ad-hoc commissioned UAV remote sensing image information, field data and modelling for impacted alder floodplain forests.

Thesis themes and supervisors

THEME 4

Area: Forestry sciences

Title: Analysis of cork oak and understory phenology using remote sensing

Thesis type: Dissertation

Institution/company; project name: ISA

Supervisors: Sofia Cerasoli (ISA); João Silva (ISA)

Main objectives:

Develop a data pipeline to use digital images and remote sensing data to improve monitoring programs on vegetation, namely to assess the impact of climate on cork oak phenology.

Thesis themes and supervisors

THEME 5

Area: Forestry sciences

Title: New approaches to estimating carbon sequestration in cork oak forests using remote sensing technologies

Thesis type: Dissertation

Institution/company; project name: ISA

Supervisors: Sofia Cerasoli (ISA); Raquel Lobo-do-Vale(ISA)

Main objectives:

The aim of the proposed dissertation is to optimize a methodology for estimating carbon sequestration in cork oak forests based on remote sensing data.

Thesis themes and supervisors

THEME 6

Area: Forestry sciences

Title: Searching for critical slowing down in frequently burned shrublands using time series of satellite imagery

Thesis type: Dissertation

Institution/company; project name: ISA

Supervisors: José Miguel Cardoso Pereira (ISA), Manuel Campagnolo (ISA)

Main objectives:

Assessing the possible slowing down of post-fire vegetation recovery after multiple fires with short inter-event intervals ("Critical slowing down" in the context of ecology refers to a phenomenon where the recovery time of a system from disturbances or perturbations increases as the system approaches a tipping point or a critical threshold)

Thesis themes and supervisors

THEME 7

Area: Forestry sciences

Title: To be defined (Related with fires in Madeira Island)

Thesis type: Dissertation

Institution/company; project name: ISA

Supervisors: José Miguel Cardoso Pereira (ISA), Rui Figueira (ISA)

Main objectives: To be defined

Thesis themes and supervisors

THEME 8

Area: Biological Sciences (biogeography and landscape genetics).

Title: Effect of ecological niche components on gene flow

Thesis type: Dissertation

Institution/company; project name: CIBIO/BIOPOLIS/UP

Supervisors: André Vicente Liz (CIBIO-InBIO/UP), Duarte V. Gonçalves (CIIMAR).

Main objectives:

This research delves into the ecological niche theory, focusing on the landscape connectivity of dryland-adapted reptiles in the Afro-Arabian desert belt.

It aims to uncover the genetic flow patterns influenced by various species' niche components such as climate, topography, land cover, and substrate. The findings will provide valuable insights into biogeography and landscape genetics, contributing to the broader goals of sustainable environmental management and conservation.

Thesis themes and supervisors

THEME 9

Area: Biological sciences

Title: Optimising management plans by disentangling the effect of environmental factors on reptile communities in northwestern Saudi Arabia

Thesis type: Dissertation

Institution/company; project name: CIBIO/BIOPOLIS/UP

Supervisors: Fulvio Licata (CIBIO/BIOPOLIS), Duarte Gonçalves, CIIMAR-UP

Main objectives:

The objectives of this work are: i) characterise reptile community life histories and functional diversity; ii) investigate the environmental drivers of reptile community assembly in northwestern Saudi Arabia through an ecological modelling approach.