Universitat de Lleida

DEGREE CURRICULUM

ST IN FOREST RESEARCH AND DEVELOPEMENT

Coordination: ALCAZAR MONTERO, JORGE

Academic year 2019-20

Subject's general information

Subject name	ST IN FOREST RESEARCH AND DEVELOPEMENT
Code	111013
Semester	ANUAL CONTINUED EVALUATION
Typology	

Degree	Course	Character	Modality
Master's Degree Erasmus Mundus in Spatial and Ecological Modelling in European Forestry	2	COMPULSORY	Attendance-based

Course number of credits (ECTS)	3
Type of activity, credits, and groups	

Activity type	PRALAB	PRAULA	TEORIA
Number of credits	1.2	0.6	1.2
Number of groups	1	1	1

Coordination	ALCAZAR MONTERO, JORGE
Department	ENVIRONMENT AND SOIL SCIENCES
Language	English

Teaching staff

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
ALCAZAR MONTERO, JORGE	jalcazar@macs.udl.cat	3	

Learning objectives

The aim is to introduce students to some of the main challenges they will face throughout their scientific careers: search and organization of scientific information, data collection and management, visualization of results, writing scientific papers and publication in specialized journals.

Significant competences

After taking this course, the students will know how to:

- Search, store and organize scientific information
- Prepare, collect, and store data in a tidy format
- Know how to make their research reproducible
- Make visualizations that accurately reflect the data, tell a story, and look professional
- Structure the information according to the requirements of scientific journals, and know the main style guidelines required
- Get through the main stages of scientific publishing

Subject contents

1. Search, storage and organization of scientific information
    1. Academic databases and search engines
    2. Reference Manager Softwares
    3. Citations

2. Collection, storage and management of data for scientific purposes
    1. Preparation of a data collection project
    2. Data management, data wrangling and the principles of tidy data
    3. Archiving data and making data available

3. Principles of reproducible science
    1. What's reproducible science?
    2. Advantages of reproducible science
    3. The reproducible workflow: from data to publication
    4. Version control
    5. Open Access Publication: the green and the gold ways

4. Fundamentals of data visualization
    1. Types of data and aesthetics
    2. Coordinate systems, axes and colour scales
    3. Directory of visualizations: visualizing amounts, distributions and proportions
    4. Principles of figure design
    5. Telling a story with data

5. Principles of scientific writing
    1. The structure of a scientific paper: abstract, introduction, methods, results, and discussion
    2. Style: from paragraphs to words
    3. The stages of scientific publication
    4. Autorship
    5. Revisions

Methodology

The course will be based on lectures with lots of practical examples. The students will also have the chance to do practical exercises on each of the Units. In some of the Units, the students will also read some recommended readings, which will be discussed later in class.

Evaluation

Grading will be based on (i) participation on lectures and debates, and (ii) completion of practical exercises

Bibliography

- Cairo, A. (2012) The Functional Art: An introduction to information graphics and visualization. New Riders Publishing.
- Cairo, A. (2016) The truthful Art: Data, Charts, and Maps for Communication. New Riders Publishing.
- Desjardins-Proulx P, White EP, Adamson JJ, Ram K, Poisot T, Gravel D (2013). The case for open preprints in biology. PLoS Biol.11: e1001563.
- Heard, S. (2016) The Scientist's guide to writing. Princeton University Press.
- Rodríguez-Sánchez F, Pérez-Luque A, Bartomeus I, Varela S. (2016) Ciencia reproducible: qué, por qué, cómo. Ecosistemas 25: 83–92.
- Wickham, H (2017) R for data science. O'Reilly Media.
- Wilke, C (2018) Fundamentals of Data Visualization: A Primer on Making Informative and Compelling Figures. O'Reilly Media.
- Wilson G, Bryan J, Cranston K, Kitzes J, Nederbragt L, Teal TK (2016). Good Enough Practices in Scientific Computing. 1–20.