COASTAL AND MARINE BIOLOGY AND ECOLOGY (LM51)

(Lecce - Università degli Studi)

Teaching MATHEMATICAL MODELLING IN ECOLOGY

GenCod A006033
Owner professor SERENA ARIMA

Teaching in italian MATHEMATICAL MODELLING IN ECOLOGY

Teaching MATHEMATICAL MODELLING IN ECOLOGY

SSD code SECS-S/02

Reference course COASTAL AND MARINE BIOLOGY AND ECOLOGY

Course type Laurea Magistrale

Credits 6.0

Teaching hours Ore-Attivita-frontale: 48.0

For enrolled in 2021/2022

Taught in 2021/2022

Course year 1

Language INGLESE

Curriculum Curriculum E-Biodiversity and Ecosystem Sciences

Location Lecce

Semester Secondo-Semestre

Exam type Orale

Assessment Voto-Finale

Course timetable
https://easyroom.unisalento.it/Orario

BRIEF COURSE DESCRIPTION	The main goal of the course is to provide basic tools for analyzing ecological data with focus on probabilistic and mathematical modeling issues. In particular the course deals with: 1) Introduction to statistics and probability; 2) Association and entropy measures; 3) Probability and statistical inference for Normal and not Normal populations; 4) Linear models and non linear models. During the course, the statistical software R will be illustrated and the students will be able to elaborate their data using it.
REQUIREMENTS	Basic concepts of mathematics and statistics.
COURSE AIMS	The course aims at providing basic methodologies for analyzing ecological data and modeling their intrinsic variability.
TEACHING METHODOLOGY	Slides, exercises provided on the web page. Practical exercises with the statistical software R.
ASSESSMENT TYPE	Written exam with R.

FULL SYLLABUS

1. Introduction: why analyzing data in ecology?
2. Exploratory data analysis and graphics
3. Deterministic functions for ecological modelling
4. Probability and stochastic distribution of ecological modeling
5. Stochastic simulation and power analysis
6. Statistical inference
7. Linear regression model and generalized linear models
8. Non linear models
9. Modelling variance
10. Dynamic models

During the course, the statistical software R will be illustrated and the students will be able to elaborate their data using it.

REFERENCE TEXT BOOKS

B. Bolker (2007) Ecological models and Data with R, PRINCETON UNIVERSITY PRESS.

A. Zuur, E.N. Ieno, G.M. Smith (2007) Analyzing ecological data, Springer Ed.

Interesing web book: http://web.stanford.edu/class/bios221/book/introduction.html