

SYLLABUS

Name: Basic Modeling in Ecology with R (25-BI-S2-W-BME-AN)
Name in Polish: Podstawy modelowania w ekologii z wykorzystaniem środowiska R
Name in English: Basic Modeling in Ecology with R

Information on course:

Course offered by department: Faculty of Biological Sciences
Course for department: Faculty of Biological Sciences

Default type of course examination report:

Grading

Language:

English

Short description:

Prerequisites regarding knowledge, skills, and social competences for the course/module:

None, but knowledge on linear models is welcome.

Student's own work:

- preparing for classes: 45h

- reading scientific papers: 35h

Description:

Educational aims:

Mastering the basics of R environment, fitting most common types of models to ecological data.

Course content:

Introduction to R and model fitting in R. Basic graphics in R. Ecological data types and random variables. Key components of linear models and generalized linear models: distributions and the linear predictor. Additive linear and mixed effects models. Data simulation and model validation. Introduction to Bayesian approach of model fitting.

Bibliography:

Mandatory and recommended reading list:

Jones E., Harden S., Crawley M. 2022. The R Book. 3rd ed. Wiley.

Zuur A.F., Ieno E.N., Walker N.J., Saveliev A.A., Smith G.M. 2009. Mixed Effects Models and Extensions in Ecology with R. Springer.

Kéry M. 2010. Introduction to WinBUGS for Ecologists. A Bayesian Approach to regression, ANOVA, mixed models and related analyses. Academic Press.

Kéry M., Royle A.J. 2016. Applied Hierarchical Modeling in Ecology. Vol. 1. Prelude and Static Models. Academic Press. (Chapters 1-4 only for this course).

Learning outcomes:

Intended learning outcomes

Student:

K_W08

knows the basics of R environment, how to read, organize and prepare most types of data to model fitting;

K_W05

knows what a statistical model is, how it works and what for it can be used;

K_W10

understands the potential of data simulation in biological research;

K_U01, K_U05

performs simulations: generates data from required distributions, introduces biases, selects and fits appropriate models to simulated data and interprets the results;

K_K01

works with real-world data: recognizes data types, chooses correct models for a given data set, fits models, analyzes them and interprets the results.

Assessment methods and assessment criteria:

Assessment methods for the intended learning outcomes:

- practical test.

Credit requirements for individual components of the course/module:

- continuous evaluation,

- practical test.

Course credits in various terms:

<without a specific program>

Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	4	2024/25-Z	