



UNIVERSIDADE FEDERAL DE SANTA CATARINA
PÓS-GRADUAÇÃO EM ECOLOGIA



SYLLABUS

SEMESTER 01 / 2022

1. COURSE IDENTIFICATION

CODE	COURSE	WEEKLY HOUR/CLASSES		TOTAL HOURS SEMESTER
ECO410032- 41000068DO/ ME	Basic Statistics			60
	Number of students	minimum: 4	Maximum: 26	Credits: 4

2. TIMETABLE

18 April to 06 May 2022. Mornings (09:00–12:00h) Afternoons (14:00–17:00h, except Mondays until 16:00)
Hybrid (83% attendance in person and 17% synchronous)

3. INSTRUCTORS

Prof. Nei Kavaguichi Leite and Prof. Luis Macedo Soares

4. COURSE OFFER

Graduate Program in Ecology at UFSC

5. SYLLABUS

Sampling, collecting and displaying data. Types of data. Graphics and tables. Measures of central tendency, variability, and dispersion. Hypothesis testing, confidence intervals. Parametric tests: 't' test, Analysis of Variance. Non-parametric tests: chi-square, Mann-Whitney, Kruskal-Wallis, Friedman. Linear Regression and correlation.

6. GOALS

To train MSc and PhD students in their first steps in basic statistical analysis and inference. We expect that all students who finished the course will have a background to start learning Multivariate Data Analysis and Statistical Modeling.

7. PROGRAM CONTENT

- Ecological question and hypothesis;
- Sampling, collecting and displaying data. Types of data. Graphics and tables. Measures of central tendency and dispersion;
- Introduction to probabilistic models: discrete and continuous data;
- Inference, assumptions of parametric tests, non-parametric tests;
- t test, Analysis of Variance: single factor, two factor, randomized blocks;
- Linear Regression, correlation and Analysis of Covariance;
- Future perspective to Ecologists: Multivariate Data Analysis and Statistical Modeling.

8. TEACHING METHOD / PROGRAM DEVELOPMENT

The course will be offered during late April and early May 2022, in a hybrid format, i.e., lectures in class and live conferences, due to COVID-19 pandemics, in accordance to the Normative nº 8/2021/CPG.

9. EVALUATION METHOD

Quizes about probabilistic models for discrete and continuous data, t test. Linear regression exercise.
The final grade will be composed of the sum of the Quizes (30%) and the Linear Regression exercise (70%).

10. SCHEDULE

	Morning (09:00–12:00h)	Afternoon (14:00–17:00h, except Mondays until 16:00)
Monday 18	Presentation and Introduction, Ecological question and hypothesis (attendance in person)	Ecological question and hypothesis, Questionnaires about student's projects (hypothesis and main goals) before the course (attendance in person)
Wednesday 20	Sampling, collecting and displaying data. Types of data. Graphics and tables. Measures of central tendency and dispersion (synchronous)	Introduction to probabilistic models: discrete data, Data bases versus spreadsheets. (attendance in person)
Friday 22	Introduction to probabilistic models: continuous data. Inference (attendance in person)	Data bases versus spreadsheets: exercises (attendance in person)
Monday 25	Assumptions of parametric tests (attendance in person)	Comparing two means: t test (attendance in person)
Wednesday 27	Non-parametric tests: chi-square, Mann-Whitney, Kruskal-Wallis, Friedman (synchronous)	t test, independent samples, paired samples (attendance in person)
Friday 29	Linear Regression and introduction to Linear Models, Correlation (attendance in person)	Linear Regression and introduction to Linear Models, Correlation (attendance in person)
Monday 2	Analysis of Variance: single factor, two factor, randomizes blocks; (attendance in person)	Analysis of Covariance (attendance in person)
Wednesday 4	Future perspective to Ecologists: Multivariate Data Analysis and Statistical Modeling (synchronous)	Linear Models in R: contrasts and interpretation (Linear Regression, ANOVA, ANCOVA) (attendance in person)
Friday 6	Questionnaires about student's projects (hypothesis and main goals): presentation after (attendance in person)	Questionnaires about student's projects (hypothesis and main goals): presentation after (attendance in person)

11. BASIC LITERATURE

Azevedo, P.R.M. Introdução à Estatística. 3ª Ed. Natal: EDUFRRN, 234p, 2016. (disponível no site: [https://repositorio.ufrn.br/jspui/bitstream/123456789/21298/2/Introdução%20à%20Estatística%20\(digital\).pdf](https://repositorio.ufrn.br/jspui/bitstream/123456789/21298/2/Introdução%20à%20Estatística%20(digital).pdf))

Gotelli, N.J.; Ellison, A.M. Princípios de Estatística em Ecologia. 1ª Ed. Porto Alegre: Artmed, 532p, 2010.

IBGE. Normas de apresentação tabular. 3ª Ed. Brasília: IBGE, 61p, 1993.

Santiago, G.S.; Paiva, R.E.B. Bioestatística. 2ª Ed. Fortaleza: EdUECE, 131p, 2015. (disponível no site: <https://educapes.capes.gov.br/handle/capes/431710>)

Magnusson, W.E.; Mourão, G.; Costa, F.R.C. Estatística sem matemática. 2ª Ed. Londrina: Editora Planta, 214p, 2015.

Silvany Neto, A.M. Bioestatística sem segredos. 1ª Ed. Salvador: do Autor, 321p, 2008. (disponível no site: http://www.pios.ufba.br/sites/default/files/BIOESTATISTICA_SEM_SEGREDOS.pdf)

Crawley, M. The R Book, 2 ed. Wiley.

Dytham, C. Choosing and Using Statistics: A Biologist's Guide. 3ª Ed. Chichester: Wiley-Blackwell, 320p, 2011.

Hector, A. The New Statistics with R - An Introduction for Biologists, 1ª Ed. Oxford: Oxford University Press, 199p, 2015.

Vieira, S. Análise de Variância (ANOVA). 1ª Ed. São Paulo: Editora Atlas, 206p, 2006.