UNIVERSIDADE FEDERAL DE SANTA CATARINA
PÓS-GRADUAÇÃO EM ECOLOGIA

SYLLABUS

SEMESTER 01 / 2025

1. COURSE IDENTIFICATION

CODE	COURSE	WEEKLY HOUR/CLASSES		TOTAL HOURS SEMESTER
ECO410032-41000068DO/ME	**Basic Statistics**			60
	Number of students	minimum: 4	Maximum: 25	Credits: 4

2. TIMETABLE

March 17th to April 2nd, 2025. Mondays, Wednesdays and Fridays, morning (08:30–12:00h) and afternoon (14:00–17:00h, except Mondays until 16:00)
100% In person

3. INSTRUCTORS

Dr. Rafael Barbizan Suhs
Dr. Alexandre Marcel da Silva Machado
Prof. Nei Kavaguichi Leite

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;
- Linear Regression and correlation.

8. TEACHING METHOD / PROGRAM DEVELOPMENT

The course will be offer during March 2025, in lectures in class.

9. EVALUATION METHOD

Quizzes about descriptive statistics, probabilistic models, t test. Linear regression exercise.
The final grade will be composed of the sum of the Quizzes (30%) and the Linear Regression exercise (70%).

10. SCHEDULE

	Morning (08:30–12:00h)	Afternoon (14:00–17:00h, except Mondays until 16:00)
Monday March 17th	Presentation and Introduction, Ecological question and hypothesis	Ecological question and hypothesis, Questionnaires about student's projects (hypothesis and main goals) before the course (attendance in person)
Wednesday March 19th	Sampling, collecting and displaying data. Types of data. Graphics and tables. Measures of central tendency and dispersion	Data bases versus spreadsheets. Data bases versus spreadsheets: exercises
Friday March 21st	Introduction to probabilistic models: discrete data, continuous data. **Assignment 1: discrete probability distributions quiz**	Inference **Assignment 2: continuous probability distributions quiz**
Monday March 24th	Assumptions of parametric tests	Comparing two means: *t* test **Assignment 3: t-test quiz**
Wednesday March 26th	Non-parametric tests: chi-square, Mann-Whitney, Kruskal-Wallis, Friedman	*t* test, independent samples, paired samples
Friday March 28th	Linear Regression and introduction to Linear Models, Correlation	Linear Regression and introduction to Linear Models, Correlation
Monday March 31st	Analysis of Variance: single factor and post-hoc tests **Assignment 4: ANOVA**	ANOVA and post-hoc tests in R and Linear Models in R: contrasts and interpretation
Wednesday April 2nd	Questionnaires about student's projects (hypothesis and main goals): presentation after (attendance in person)	Linear Regression exercise: exercise delivery, correction and discussion. **Assignment 4: Linear Regression**

11. BASIC LITERATURE

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