FEDERAL UNIVERSITY OF SÃO CARLOS FOUNDATION

GRADUATE PROGRAM IN PHYSIOTHERAPY – PPGFt/CCBS/R

COURSE CHARACTERIZATION FORM

Graduate Program: Physiotherapy

Course Code: FIT-605

Credits: 6

Course Title: Regression Analysis: Modeling Strategies in R

Start of Validity: 2025 – 2nd Semester

Justification

This course aims to provide graduate students of the PPGFt with advanced training in quantitative data analysis techniques commonly used in clinical research. The focus is on developing conceptual understanding and practical skills in regression modeling strategies using the R programming language.

Course Workload

Theoretical Classes: 30 hours

Practical Classes: 30 hours

Exercises/Seminars: 30 hours

Course Syllabus

• Introduction to the R programming language and RStudio

• Regression models in RStudio

• General aspects of regression model fitting

• Multivariable modeling strategies

• Analysis of clinical trial data with one follow-up

• Analysis of clinical trial data with two or more follow-ups

• Development of prognostic and diagnostic models

• Evaluation of new biomarkers

Students will have the opportunity to learn how to use the R language to perform advanced data analysis within the context of clinical research, potentially using data from their own research projects. If such data are not available, simulated data or data from open-access databases may be used.

As an assessment method, students will be required to submit and/or present an individual assignment consisting of a complete statistical analysis plan, including the description of methods and R code to be used. The plan should be compatible with and aligned to the student’s research

project, fostering engagement with the course content.

Nature of the Course

Elective course for both Master's and Doctoral programs.

Prerequisites

DIP-030 – Biostatistics

Main Bibliography

Harrell FE. Regression Modeling Strategies. 2nd ed. Springer, 2015.

Steyerberg EW. Clinical Prediction Models. 2nd ed. Springer, 2019.

Riley RD et al. On the 12th Day of Christmas, a Statistician Sent to Me. BMJ, 2022.

Mansournia MA et al. The CHAMP Statement. British Journal of Sports Medicine, 2021.

Elkins M et al. Statistical inference through estimation. Brazilian Journal of Physical Therapy, 2022.

Elkins M. Interpreting confidence intervals. Journal of Physiotherapy, 2024.

Amrhein V et al. Scientists rise up against statistical significance. Nature, 2019.

Mansournia MA, Nazemipour M. Recommendations for accurate reporting in medical research statistics. The Lancet, 2024.

Mistry EA et al. NIH Stroke Scale as an Outcome in Stroke Research. Stroke, 2022.

Detry MA, Ma Y. Analyzing repeated measurements using mixed models. JAMA, 2016.

Main Responsible Faculty

Tatiana de Oliveira Sato – Permanent Faculty

Leonardo Furlan – Visiting Faculty

Approval

Approved at the 10th Extraordinary Meeting of the PPGFt Graduate Program Committee on July 4, 2025.

São Carlos, July 7, 2025.

Prof. Dr. Anielle Cristhine de Medeiros Takahashi

Chair of the PPGFt Graduate Program Committee and Coordinator of the PPGFt – UFSCar