FEDERAL UNIVERSITY OF SÃO CARLOS FOUNDATION

GRADUATE PROGRAM IN PHYSIOTHERAPY – PPGFt/CCBS/R

COURSE CHARACTERIZATION FORM

Graduate Program: Physiotherapy

Course Code: FIT-607

Credits: 1

Course Title: Disentangling Cardiovascular Control Mechanisms via Different Analyses of Spontaneously Varying Variables

Start of Validity: 2025 – 2nd Semester

Justification

This course aims to update participants on cardiovascular control mechanisms using the analysis of cardiovascular oscillation variables.

Course Workload

Theoretical Classes: 8 hours

Practical Classes: 0 hours

Exercises/Seminars: 7 hours

Course Syllabus

• Overview on heart rate variability and cardiovascular control: experimental protocols and methodologies of analysis

• Baroreflex control: from signal acquisition to methods for assessing cardiac, sympathetic, and peripheral baroreflex sensitivity

• Symbolic dynamics and complexity analysis to infer cardiovascular control mechanisms

• Cardiorespiratory coupling: analysis methods and applications

• Directed study: reading and discussion of scientific texts and manuscripts

Nature of the Course

Elective course for both Master’s and Doctoral programs.

Main Bibliography

Bari V et al. Comparison of the impact of carotid endarterectomy and stenting on autonomic and baroreflex regulations. Scientific Reports, 2024.

Cairo B et al. Long-term impact of COVID-19 on cardiorespiratory control and baroreflex. Biomedical Engineering Online, 2025.

Bauer A et al. Reference values of heart rate variability. Heart Rhythm, 2017.

De Maria B et al. Autonomic dysfunction and heart rate variability with Holter monitoring. Herzschrittmacherther Elektrophysiol, 2021.

Guzzetti S et al. Symbolic dynamics of heart rate variability. Circulation, 2005.

Porta A et al. Changes of the cardiac baroreflex bandwidth during postural challenges. American Journal of Physiology, 2023.

Porta A et al. Model-based spectral causality of cardiovascular variability interactions. Physiological Measurement, 2023.

Ranucci M et al. Baroreflex sensitivity and outcomes following coronary surgery. PLoS One, 2017.

Catai AM et al. Heart rate variability: are you using it properly? Brazilian Journal of Physical Therapy, 2020.

Abreu RM et al. Cardiorespiratory coupling strength in athletes and non-athletes. Respiratory Physiology & Neurobiology, 2022.

Main Responsible Faculty

Aparecida Maria Catai – Permanent Faculty

Alberto Porta – Visiting Faculty

Vlasta Bari – Visiting Faculty

Beatrice Cairo – Visiting Faculty

Raphael Martins de Abreu – Visiting Faculty

Approval

Approved at the 295th Ordinary Meeting of the PPGFt Graduate Program Committee on August 28, 2025.

São Carlos, August 28, 2025.

Prof. Dr. Anielle Cristhine de Medeiros Takahashi

Chair of the PPGFt Graduate Program Committee – UFSCar