

Computational Neuroscience (MAP 5932–003)

Syllabus, Fall 2023

M,W,F 1:20–2:10 107 Love Bldg.

Professor: Prof. Richard Bertram
Office Hours: M,W,F 11:00–12:00, or by appointment
Office: 114 Love Bldg.
E-mail: rbertram@fsu.edu

Text: Principles of Computational Modelling in Neuroscience, by Sterratt et al., Cambridge Press, 2014

Course Topics: This special topics course focuses on how one generates and understands models of neurons. We will cover some of the topics in the text, as well as additional topics that will be introduced in class. The primary focus is on the biophysics of a neuron, including its electrical properties and synaptic transmission of neurotransmitters.

Course Objective: Convey an understanding the biology of neurons, how neural models are generated, and how to analyze them computationally and mathematically. Also, to build proficiency in programming in MATLAB and XPPAUT for biological applications. Finally, to build expertise in presenting scientific material.

Approach: I will be lecturing during many of the class meetings. Students will also be presenting homework material in teams as lectures, complete with Powerpoint slides. There will also be final team-based projects that will be more ambitious than the shorter homework problems.

Computer Software: The XPPAUT software is free and is set up specifically to solve and analyze ordinary differential equations. It can be downloaded onto your computer from Bard Ermentrout’s web page. MATLAB is available to all FSU students (google “FSU Matlab” and you will find the download site).

Expectations: There will not be any exams. Grades are based on attendance in class and active participation in all team projects.

American Disabilities Act: Students with disabilities needing academic accommodations should: 1) register with and provide documentation to the Student Disability Resource Center (SDRC); 2) bring a letter to the instructor from SDRC indicating you need academic accommodations. This should be done within the first week of class.