Colorado State University, Department of Biochemistry and Molecular Biology
BC 441: 3D Molecular Models for Biochemistry
October 14- Dec. 15, 2019 (8 weeks)
Credit: 1 (1 h lecture, 2 h lab for half semester)
Tuesday 3:00-3:50, Thursday 3:00-4:50
Location: AZ E208

Instructor: Marcello Pignataro
E-mail: marcello.pignataro@colostate.edu
Office: 236 MRB
Office hours: Given the restricted number of students, I would prefer to be directly contacted by e-mail (or talked to after class) to schedule an appointment. Feel free to also e-mail me if you have any question.

Prerequisites: BC 401 or concurrent registration

Course description: Modeling and visualizing the structure of biochemically relevant macromolecules such as proteins and nucleic acids is critically important to understanding their molecular interactions as well as how these are affected by mutations and post-translational modifications. Here we will explore how to read a structure file, utilize software to visualize structures and analyze features that inform on molecular interactions. As the structure of many macromolecules has not been experimentally determined, we will utilize bioinformatic tools to predict structures, with a focus on homology modeling.

Objectives: students are expected to learn how to use stand-alone software and web-based tools to predict structures and to visualize existing and newly generated biomolecules. Furthermore, they should learn how to assess the quality of built structures and how to use these methods in research-relevant applications.

Textbook and materials: all the materials will be provided by the instructor through Canvas.

Grades: 10% of the grade is related to class participation, 10% is related to short quizzes that will be given every one/two weeks, while the remaining 80% is related to two projects. Both projects will require a written report. One report (30% of the grade) is due November 22 (last day before Thanksgiving break) and after it is returned after Thanksgiving break, there is an opportunity to correct and resubmit for additional credit. The final project (50% of the total grade) is due by Dec. 17 (Tuesday of Finals Week). This project will address a research question. More details on the two projects will be provided early in the course.