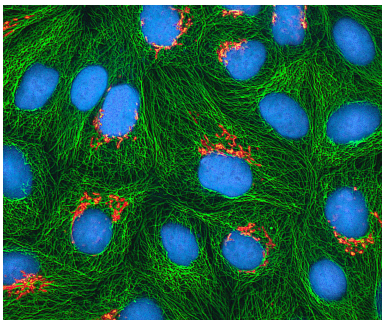
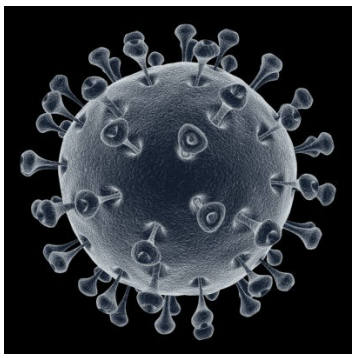
Spring 2024, Applied Mathematics

APM 530 Mathematical Physiology

Instructor: Sharon Crook
Time: 10:30 –11:45 Monday and Wednesday
Location: COOR L1-80
Credits: 3



Are you fascinated by cells and what they do in the body? Or maybe you just want to learn more about cell modeling. This introductory course focuses on using mathematical models and computation to study the dynamics of cell biology, including networks or groups of cells, and their role in the body. Historically, mathematics has played an important role in the study of the mechanisms underlying physiology. We will develop and analyze mathematical models for various aspects of cellular biology including diffusion, membrane transport, ion channel kinetics, excitable membranes, and calcium dynamics. We will also use computational methods to perform numerical simulations for all of the models discussed in class. The course will be organized around short lectures, accompanying homework assignments and computer laboratories, discussions motivated by relevant published articles, and student projects.



Prerequisites: Elementary Differential Equations (MAT 275 or equivalent).

This is a self-contained course open to graduate students in mathematics, life sciences, engineering, physics, and psychology, **as well as upper-level undergraduate students** with permission from the instructor. All mathematical concepts beyond elementary differential equations will be covered during the semester.

Note that Dr. Crook offers this course every three or four years, so if you are interested in her course, Spring 2024 is the best time to sign up.