

Spring 2019, Applied Mathematics APM 530 Mathematical Physiology

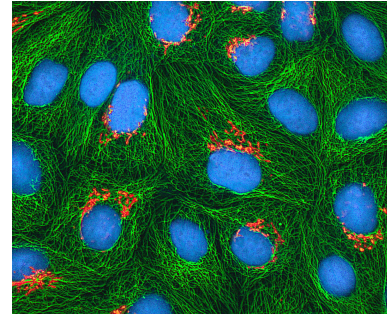
Instructor: Sharon Crook

Time: 3:00 – 4:15 Tuesday and Thursday

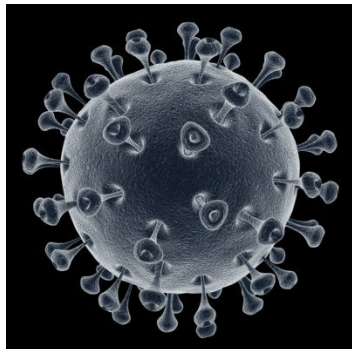
Location: ECA A221

Schedule Line #: 31183

Credits: 3



Are you fascinated by cells and what they do in the body? Or maybe you just want to learn more about this area of mathematical biology. 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.