

BME233 (W2021): Dynamic Systems in Biology and Medicine—Syllabus

This is a **tentative** syllabus for BME233 (Dynamic Systems in Biology and Medicine). The syllabus may change as the course develops.

Lectures	Mondays and Wednesdays from 2:00 PM to 3:20 PM Virtual remote only (zoom link will be provided)
Instructor	Prof. Zoran Nenadic znenadic@uci.edu 3416 Engineering Hall
Office Hours	by appointment only
Required Text	none
Recommended Text	1) NONLINEAR DYNAMICS AND CHAOS <i>With Applications to Physics, Biology, Chemistry and Engineering</i> by S. Strogatz 2) A FIRST COURSE IN SYSTEMS BIOLOGY by E. O. Voit
Course Objective	The course objective is to introduce students to the elements of system theory, and apply these principles to analyze biomedical, chemical, social and engineering systems. Students will use analytical and computational tools to model and analyze various dynamic systems. Examples include: population dynamics, Lotka-Volterra equation, Hodgkin-Huxley and Morris-Lecar equations, Belousov-Zhabotinsky chemical oscillators, etc.
Prerequisites	Basic understanding of differential equations, complex numbers, infinite sequences and series. Basic knowledge of linear algebra, such as systems of algebraic equations, vectors and matrices. MATLAB or programming language of choice necessary for computer exercises.
Grading Policy	Homework: 30%, Take Home Midterm: 30%, Take Home Final: 40%.
Overlapping Courses	This course does not overlap with any other core or satellite course in the Henry Samueli School of Engineering and in the School of Biological Sciences.