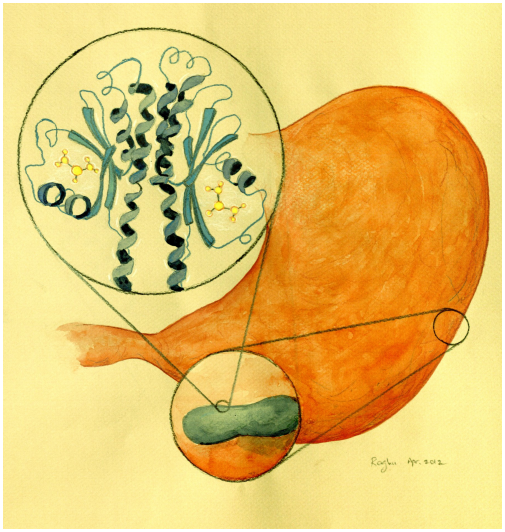
THE PHYSICS OF LIFE (PHYSICS 171)	PROFESSOR RAGHUVEER PARTHASARATHY (**Par**-tha-**sa**-ra-thē) *EMAIL: raghu@uoregon.edu*

COURSE DESCRIPTION



Why can't elephants jump?

We all asked excellent questions like this when we were very young, but have since largely given them up, concluding, perhaps, that the answers are too complex to be grasped by the merely curious. In this course we'll dispel such doubts, and realize instead that we can illuminate many of the mysteries of life by adopting a physical perspective, taking fairly simple physical concepts and applying them to the world of living things, in the processes figuring out how insects walk on water, how you pack a meter of DNA into each of your cells, how and why bacteria swim, how proteins fold themselves into complex shapes, and how the struggle between gravity and bone strength causes problems for acrobatically inclined large animals.

The Physics of Life is a course designed for non-science major undergraduates, in which we explore the broad field of biophysics. We will examine the ways in which physical laws and principles guide and constrain life, and the physical properties of microscopic and macroscopic biological materials.

We will explore questions such as "What are you made of?," the multifaceted answers to which continue to fascinate scientists. It is easy to make a list of your "parts" – cells, bones, muscles, etc. – but this is neither interesting nor illuminating. What is it about your flesh that makes you squishy? How can the edges of your cells be strong, yet made of liquid? If you shrank a whale to the size of a bacterium, could it swim the same way? These questions, like many at the forefront of contemporary science and medicine, bring together concepts from a variety of disciplines, mixing together biology, chemistry, and physics.

There are no scientific prerequisites for the course, and mathematics used will be at the level of elementary algebra. Beyond exploring exciting areas of contemporary science, a key goal will be to better understand the process of science, i.e. how we know what we know.