



School for Scientific Thought

Saturday Science for High School students

October 6, 13, 20, 27 and November 3, 2018 -10:00am-12:15pm

Courses available:



Understanding our material world: From atoms to catastrophe

Have you ever wondered how engineering disasters occur? Why did the Titanic sink? What led to the failure of the Challenger and Columbia Space Shuttles? Everything in our daily lives is made up of carefully engineered materials, but sometimes these materials can fail and lead to catastrophe. This course will introduce the field of Materials Science and Engineering (which unites chemistry, physics, biology, and engineering principles) to understand, improve, and design materials for everyday life. We will start our journey at the atomic scale and discuss how atoms can be arranged to form actual materials like metals, polymers, and ceramics. Using real-life examples, we will learn how to understand the properties of everyday materials based on their atomic arrangements, discuss how different materials can be made, and give plenty of examples of how they can fail and how we can avoid these failures! (Materials Science)

How Cells Use the Force

From individual cells dividing to the development of whole organisms, physical forces help shape and move life itself. By understanding how forces influence biology, we can start looking at the field from a different perspective. This course aims to teach fundamental concepts from biology and engineering to understand cutting edge research being conducted here at UCSB. We will begin by learning the inner workings of the cell and continue by discussing how cells exert and interpret mechanical forces. By the end, we plan to integrate different concepts to demonstrate how they can be used to look at the forces produced by a tissue. This session is intended to demonstrate how different fields can come together and be used to answer questions in research. (Molecular, Cellular & Development Biology)

Networks: Hearts of Complex Systems

Networks are everywhere, from the internet, to social networks, and the genetic networks that determine our biological existence. Due to the recent exploding interest in network science, it is called the science of the 21st century. In this class we introduce network science, and learn about graph concepts, metrics, and properties of real networks. We will discuss applications of network science in epidemic propagation and opinion dynamics. The sessions will be consisting of lectures, applying the concepts on the sample codes, and interactive question and answer sessions. (Electrical and Computer Engineering)

Applications are due September 26 and classes start October 6!

<http://sst-csep.cnsi.ucsb.edu/>

It's fun, it's free and there is no homework! All participants are welcome to join a free pizza lunch following the classes each week.