Physics 301 Summer 2012 Course Description:

This course is not an advanced version of Physics 101 and indeed is mostly a history/philosophy of science. There are no numerical problem sets to do, but rather homework consists of reflective essays.

The goal of the course is to better examine the relation between science and culture and to better understand the nature of science as a process, rather than science as a collection of formulae that you plug numbers into (that’s engineering)

To be a responsible citizen in a world threatened by resource shortage, climate change, and global equity and justice issues, an understanding of the processes and nature of science and the ability to perform scientific inquiry is a requirement—not an option. It therefore does not suffice to simply teach facts and have students perform "cookbook" laboratory experiments that serve only to verify these facts. Rather, students must be immersed in the scientific process by actually thinking scientifically about human issues. A principle goal is to instill in the students the importance of data, data literacy, and an understanding of where all the errors lie in your process/experiment.

The mechanism for doing this will be historical in nature. We will examine, in different periods of history, some of the fundamental questions that existed at that time. Some examples include (but are not limited to):

Early Greece: Is the Earth really at the center of the universe?
Nineteenth century: What is the age of the Earth?
Early twentieth century: What is the nature of light? How do stars produce energy?
Now: What is the scientific case of human induced global climate change?

In addition, each scientific topic or question will be couched in the cultural context of the time, since science is not done in a vacuum and true scientific impact can only happen through a meaningful dialogue with culture.