8.01 Physics I: Classical Mechanics, Fall 1999

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Transcript – Course Introduction

Well, the goal is to introduce the student for the first time to physics. That is to say calculus-based physics. Many students have already had some of that in high school, but many have not. And 8.01, the first course of physics covers Newtonian Mechanics which is at the heart of the course.

Depending upon the lecturer, we also cover Fluid Mechanics a little, and we cover a little of the Kinetic Gas Theory. Well, this course is a general Institute requirement. You either have to take this course or you have to take one that is slightly higher level which we call 8.012. We evaluate the students through traditional exams. The lectures are given in the main lecture hall of MIT, 26-100. And then the students meet in small groups with professors. We call those recitations, which is largely problem-solving. I would like to think that every lecture is an event. And, where possibly, I go outside the standard curriculum.

I talk about neutron stars. I talk about black holes. I talk about Big Bang cosmology. In a very natural way do I introduce musical instruments. I talk about supernova explosions. And then, during my last lecture, I introduce students to my research, the research I did during my early days at MIT when I made observations, astronomical observations in x-rays from very high flying balloons. Those balloons are giant in size, sort of the size of the Empire State Building, and they went up to an altitude of about 145,000 feet. And that is my last lecture. And all of these lectures are really events. Well, the course material on OCW are my lectures in addition to being the standard material that you expect from Newtonian Mechanics, from Fluid Mechanics and from Kinetic Gas Theory.

As I mentioned earlier, I try, where possible, to go a little bit beyond that and to make them see through the equations. And, by doing that, I make them aware of the environment of neutron stars, of black holes, of supernova explosions, of musical instruments. I only do that where it comes naturally, but there are many places where it comes naturally. So my goal is not so much to cover a lot and to make them chew on a lot of equations.

But my goal is to uncover several very basic things that they will remember for the rest of their lives. Even if they never need physics anymore, I want them to see the beauty of physics; I want them to love physics.