

18.085 Computational Science and Engineering I, Fall 2008
Transcript – Course Introduction

PROFESSOR: I love teaching this course, and I tell the class that the first day. But because of them, I've learned that they are really serious.

And I have something that I hope they get, which is the idea-- many of them took calculus, differential equations, survived it, didn't especially enjoy it. And I'm always hoping that they see what math is about, and how it looks for the pattern in a whole lot of different applications. Often engineering, but many others too. Science, economics, biology, wherever.

And if they see the pattern, then they're really seeing what mathematics brings beyond just formulas, which is not what the subject's about, but getting answers and understanding.

So one part of the course is the modeling, getting the equations, what's the structure. And the second part of the course is how do you solve the equations? Sometimes analytically, sometimes numerically. And that's, of course, the reality of being a scientist or engineer now.

So this course is three times a week. Very typical hour's lecture. And a fair amount of homework, including some Matlab homework, because that's the reality of how people get answers. And also, of course, analytical, pencil and paper homework to see the central ideas and use. And office hours from TAs.

Because a lot of people haven't had linear algebra. They haven't had [? 18.06 ?] when they take this course. And so they ask, do I have to know linear algebra? And I say, well, maybe not, but you soon will.

Well, I think it's so fantastic to be able to have OpenCourseWare and try to do something beyond MIT. And so, what am I trying to do? I guess, I think that the teaching of applied math has a big step forward still to take. That we, in many situations, we're doing what we did a while ago, and not really bringing it home, making the subject what it can be. And part of that has got to be numerical solution of the equations, and also new applications.

Well, 18.085 , or really, 18.075 has been an MIT course for a long time. And Professor Hildebrand's textbooks were used. He was an exceptionally good teacher. But computing wasn't part of it, really. And it has become part of what all users do to get answers.

So the course had to move forward, and the first step was about 20 years ago with a new textbook, a different approach. And I have had a wonderful time teaching classes over those years, and now it's ready for the next generation.

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