

Welcome. Before diving into this class, it is useful to have a sense of its character and objectives.

First, we want to introduce the probabilistic way of thinking. This involves understanding the nature of probabilistic models, the key concepts, and the mathematical language that goes with them. At the same time, we want to expose you to some of the main types of models that tends to arise in applications.

Second we want to introduce the basics tools of probability theory expressed in the language of mathematics. We will develop a fair number of mathematical skills. Indirectly we also want to advance your ability to think with precision and to express your thinking in a mathematical language.

On the other hand this is not a mathematics class. Our aim is not to teach you how to prove theorems nor is it to teach you recipes-- how to plug numbers into formulas without thinking. Instead, we will emphasize the interpretation of basic concepts and related facts at an intuitive level, always aiming to complement mathematical arguments with intuitive explanations.

Finally, our most important goal is to bring you to a level where you're ready to apply what you have learned to real world problems. Say, in the context of your job or in a research project. This is a very ambitious goal and the course covers perhaps 40% more than what you would see in a typical introduction to probability class. But we believe that our ambitious goals are realistic.

Calculus and mental concentration is all you need. The material in this class has been refined, condensed, and codified over about 50 years of residential offerings at MIT. As a consequence, our hope is that the material is organized and presented in a way that allows learning to move at a fast pace.

Finally I should add some comments about what this class is not about, so as to keep your expectations realistic. First, as it should be clear from what I said before, this is not some kind of overview class for general scientific literacy. It is not just about understanding what you hear. We really want you to be able to use what you hear.

Also, while the subject is very much driven by applications, we will not go through the details of real world examples. Instead, we will go through many examples that serve to enhance your general

understanding. In the same spirit, there will not be much in terms of demos, illustrations through plots, or computational exercises. We hope that you will find the mix of material that we have chosen to be really useful and that the end result will be rewarding.