

# MIT 18.03 CLASS GUIDE

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## 1. WELCOME

Welcome to Math 18.03 for the Fall 2020 semester. This document is meant to be a kind of expanded syllabus; it will discuss the plan for the class, the resources available to you and provide some suggestions on how to approach this class, and education in the era of COVID in general.

The Fall 2020 semester is going to be challenging. In essentially any other semester we would all meet three times a week in lecture. Each lecture I would explain a set of concepts, work through some examples, give you some problems to think about and answer your questions. In addition to these weekly meetings you would attend recitation once a week and get a chance to work closely with a TA. These opportunities for interaction would allow me and the course assistants to make sure you are keeping up with the material. Perhaps more importantly, however, these opportunities would allow you to interact with your classmates, to discuss the course content, to collaborate, share ideas and work on problem sets together. These social interactions between you and your peers are an essential part of learning: we learn deeply by doing, struggling and overcoming— not by listening to a sage on a stage (I’m the sage, in this story).

Online education makes many aspects of this traditional education experience challenging. If you have ever attended a zoom lecture, you probably know how difficult it can be to pay close attention. The person on the tiny screen is barely moving! They can’t see you! You can play flappybird! Read the news! The distractions are endless. For this reason, I have decided to use a model for the class which is better suited to online education. However, this model asks more of both of us, so we have to make a commitment to one another to make it work.

In Math 18.03 this fall, I will ask you to spend time each week making a serious effort to learn a chunk of material on your own. I don’t expect you to master the material (though if you do, that’s great). Independent learning is hard— it is a skill hard won over a long period of time in a typical university education. It took me until at least my fourth semester of university before I really ‘learned how to learn’. With this in mind, I am going to try to help you develop active learning skills. Each week there will be

- (i) A list of MITx readings, with associated practice problems.
- (ii) A set of short videos in which I explain key concepts, go over examples or solve problems.

- (iii) A (non-exhaustive) list of concepts and suggested questions you should keep in mind while reading.

It is absolutely essential that you do the readings and watch the videos. You should take your own notes while going over the material! The practice of writing things down is essential to learning. It is also essential that you learn actively— as you take notes, try to identify the most important ideas and concepts and ask yourself “why” or “how” questions. Item (iii) is meant to help you develop these habits.

As you go through the material you will surely have questions (tip: anytime you quickly understand something, be very wary!). To support your learning we, the academic staff, are going to be very available to answer your questions, help you when you're stuck, or just provide words of encouragement. You will be able to get help via four different avenues

- (i) Lectures.
- (ii) Recitations.
- (iii) Piazza
- (iv) Virtual Study Hall.

Options (i) and (ii) are pretty self-explanatory. We will provide a way for you to submit questions, and upvote classmates questions. We will then try to answer the most popular questions in our synchronous interactions. Piazza, a tool for asking, and answering questions associated to the course, is a tool many of you are probably familiar with. I will elaborate on virtual study hall below.

**Weekly Competition:** To encourage you to work together, we will have a weekly competition amongst recitations. Whichever recitation has the highest average on the weekly problem set will get to submit 2 (appropriate) images which I **must** include in the next week's Explain Everything videos. I look forward to your strange, amusing (and importantly, appropriate) submissions.

Virtual study hall is a place where you can meet your peers, discuss the course, find collaborators for solving homework problems, or get help from TAs— it is meant to help facilitate the interactions which would occur naturally during a regular academic year. Virtual study hall will be hosted on Slack, which is supported by MIT. TAs will be available to help you in virtual study hall for at least two hours everyday, but it will be open to you at all times. The specifics of virtual study hall are discussed in a separate document, but I want to emphasize some important aspects which also apply to the course more generally.

- The more we participate, the more we all benefit. We must all make an effort to build a sense of community in this new online world.
- We must get comfortable admitting when we don't understand something. Ask for help, both from TAs and peers. Don't be shy! Being confused is an essential part of learning!

- Be kind and empathetic when answering your classmates questions, or collaborating. We all struggle with new concepts. Treat others as you would like to be treated.
- If you think you can answer a classmates question, or have a solution to a problem, share it! Either you will answer their question, or you will discover gaps in your own understanding. Both of these are great outcomes! We can learn deeply by trying to explain ideas to others.
- Learning is hard and there is a tremendous benefit to spending individual time learning new material. But collaboration and open discussion is equally beneficial. We must try to cultivate an environment which encourages this kind of interaction.

In summary, this semester is going to be new and challenging. But there are also exciting opportunities to foster a new sense of community, not just in 18.03, but across the institute more broadly. Let's take this opportunity!