How to succeed in CST?
Tal Malkin and William Pires, Fall 2026

Here are some tips on how to succeed in this class. Many of these tips may be applicable to other classes, especially math / theory-based classes, but certainly for ours! The tips are based on our experience teaching this class for many years, and involvement with multiple recent workshops on research-based teaching best practices.

Some general principles:

– You should rely on us and on what we teach as your main/first source.
Reason: We put a lot of thought into what to teach, in which order, how to explain it, what examples to give, etc. We are also the ones designing the homework and the quizzes and the final, having in mind what we taught and our goals. Our curation of the material and our availability for interaction and answering your questions (yes, specifically yours!) is something that distinguishes this in-person class from you trying to learn on your own from outside sources. We encourage you to take advantage of it.

-- Manage your time well, and stay on top of the material. **Don't fall behind**.
Reason: the material in this class often builds on previous concepts and can move fast. It can sometimes feel deceptively simple/easy, and suddenly become deep and challenging (and beautiful!). The second half of the semester tends to be more difficult for students than the first half, but staying on top of things and addressing any gaps you have early will help. We tried to structure the class so that it's easier to not fall behind, but you should try on your end as well.

-- It is very important in this class to **understand definitions fully and internalize them**. The best way to approach a problem you're trying to solve is to start by thinking hard about what the question means -- what are you supposed to do exactly? This may sound obvious, but many students start by skimming the question, looking for similar-looking things in lecture, trying to get a feeling for the general way you approach questions that look like this... These are all good things to get a feel for, but cannot replace the precise understanding of what the question is -- often that's the hardest part.

-- **Getting stuck and being challenged is a great learning tool** (see, e.g., [1]). Often, when someone (like the instructor) tells you how to solve something, it sounds reasonable and you feel you understand, but being faced with a similar question later, you find you don't know how to do it. If you instead first try, and fail, and try another approach, or even just spend some time being stuck and trying to understand what this even means, it will help you understand more deeply when you finally figure out (alone or with help) what the answer is.

With the above general principles in mind, here are some more concrete ways to instantiate them:

-- **Attend lectures, and be present and engaged**. While we do not track attendance or directly grade based on it, we do require it in the sense that we assume that students know what was said in class. In our experience, attending class (and being present and engaged) is quite helpful for your success on all the assignments and tests.

-- Before each lecture, **go over the previous lecture carefully**. The corresponding textbook chapters and handouts we provide can also be very helpful as a supplement. As you read and see examples or theorems, pause and try to think about how you would do it or prove it (don't be discouraged if you don't know how! just thinking about it will make it easier to understand and remember when you keep reading what was actually done). We will assume students have gone through the material so far before the next lecture.
What about reading ahead? – this is optional (start with reading the previous lecture material first). If you follow well in class, in real time, then reading ahead is not needed. But if class pace is a bit too fast, it can be very helpful to read ahead in the textbook-- we will try to post what we expect to teach in the following couple of lectures together with the lecture summaries and readings.

– **Don't hesitate to reach out to us!** The teaching staff for the class includes two instructors and 15 TA/CAs, eager to create a learning environment that is supportive and challenging. Come to office hours! ask questions on EdStem! (but we recommend spending a bit of time being stuck, figuring out what it is that you're not sure about before asking or even reading other people's questions and answers -- this helps your learning). We will try to answer your specific questions, but also to help you identify where the root of your difficulty is, and how to address it.

-- **How to study for quizzes and the final?** Go over class material that we taught, handouts, checkups, homework. Use the strategy discussed above: spend a lot of the time on reading the definitions and the questions, not just the solutions, and try to do things yourself first. Practicing your problem solving skills is very important in this class. We recommend that you redo various problems we saw in class, the HWs, Handouts or the book *from scratch*. This is a good measure of ``can I solve this kind of problems now?'' This shouldn't be about memorizing solutions to the problems you've seen, but understanding how to solve them.

– **What if a quiz or homework went wrong?** You can view the homework and first quiz as practice and a way for you to know where you stand on the material: Remember that for each quiz, there is an optional reassessment on the final exam. Hence, if an assessment didn't go well: don't panic. You should try to understand what went wrong: was it just a bad day? Are there deeper misunderstandings in the material ? Did you study in a good way (see tips above)? Reach out to us! Our goal is to help you reach a point where you feel confident and understand the material, both the technical skills and the higher level take-aways (and hopefully even enjoy the process of learning it).

-- **Should you study with friends or alone?** We recommend both! For the fundamental definitions, it's good if you spend some time alone to try to understand them. But then, discussing concepts with other students in the class, asking about things you didn't understand,

giving feedback to each other, brainstorming, and practicing together, can be very helpful. It makes the learning more active, and more fun. Ultimately, for the type of learning we do in this class, whether group work or individual work is better really depends on your learning style (but the quizzes and final will be individual).

-- **What about using AI?** AI can be a great tool for many things (we use it too!) but, in our view, not for the learning goals of this class. In a theoretical and conceptual intro-level class like ours, the simplest way to use AI ("explain to me how to solve this problem, I don't know!") can in fact be detrimental to your learning -- at least if you do it before spending a lot of time trying to do it yourself, being stuck, going back to the basics, identifying what you're missing, etc [2]. And even after, we recommend discussing with naturally intelligent humans like the teaching staff or fellow students, which is good preparation for ultimately succeeding in the quizzes and final. (See also the recent MIT report on AI and education [3] and the preprint [4] that discusses people's tendency to the "cognitive surrender" to AI).

References:

[1] M. Kapur. "Productive Failure in Learning Math." *Cognitive Science*, 38(5), 1008–1022, 2014.

[2] H. Bastani, O. Bastani, A. Sungu, H. Ge, Ö. Kabakcı, and R. Mariman. "Generative AI without guardrails can harm learning: Evidence from high school mathematics." *Proceedings of the National Academy of Sciences*, 122(26), e2422633122, 2025.

[3] MIT Ad Hoc Committee on AI Use in Teaching, Learning, and Research Training. *Report of MIT's Ad Hoc Committee on AI Use in Teaching, Learning, and Research Training.* Massachusetts Institute of Technology, August 13, 2026. https://web.mit.edu/files/AI-Committee-Final-Report.pdf

[4] S. D. Shaw and G. Nave. "Thinking—Fast, Slow, and Artificial: How AI is Reshaping Human Reasoning and the Rise of Cognitive Surrender." *The Wharton School Research Paper*, 2026.