

How to get an “A” in my class (by Kathryn Mann)

achieving success in an upper-level undergraduate mathematics course

This is an advanced class, and as such, requires *work*. Active work. The good news is that this is something anyone can do – mathematics at this level is a matter of practice and good habits, and *not* “talent” or “genius”.

1. Read the textbook

I chose our textbook (^{Judson's} ~~Dummit and Foote~~) because it is comprehensive and contains lots of examples, which are *very helpful* in a course like this. See my tips on reading, below. (and free!)

2. Lectures are not a spectator sport

Ask questions of me, and of yourself. Answer questions – or make a guess, or answer with another question.

3. Do (and redo) your homework early and thoughtfully

Homework problems are intended to *challenge* you and *help you teach yourself* the material. Expect to get stuck. DO NOT PANIC. It is okay to get stuck – this is part of learning. Factor in time to sleep on a problem and try it again the next day.

4. Train like you're at the gym

Solving math problems is a matter of building mental muscle. You build strength for this by training (reading, thinking, and working on problems) *regularly* and *consistently*.

The more reps you do the stronger you will get. Vary the weight (i.e. difficulty) of the problems you try. Challenge yourself by thinking long and hard about things you don't understand. Would you train for a marathon by running as hard as you can all night long the night before? Treat your math course the same way.

How to read a textbook that looks like an encyclopedia

Takeaway message: *Use the textbook to help you get more out of lectures.*

1. Skim before lecture

Before lecture, skim through the content we covered last time. What were the big ideas? Then flip through the introduction to (or main theorems or definitions) in the upcoming content - can you figure out what the new big ideas are?

2. Question-oriented reading after

Re-read the section carefully after lecture, paying special attention to the examples. Compare them with examples done in class. Force yourself to write down at least one question, for example: “where did we use assumption X in this theorem?” “What if we try to prove this assuming Y instead?” “Is Z also an example of a...? Why or why not?”

3. Exam review

Return to “big picture” reading, with your new knowledge. Make a summary of the key concepts, definitions, and techniques that were introduced *in lectures and homework exercises* and use the textbook to enrich and enhance these notes, filling in more details and examples.