How to Succeed in Class by Really Trying

While CMPU 145 is mathematically intensive, it may be quite different from the math classes you’ve taken before. Many math classes – especially in high school – focus on teaching math as computation. E.g., in an algebra class you might memorize the quadratic formula and apply it to solve many problems. In a calculus class, you memorize how to take the derivative of a polynomial, and then you use those skills to take derivatives in various contexts.

The mathematical content in CMPU 145 is less about memorizing or calculating than it is about understanding and argumentation. This class seeks to teach you how to answer questions of the form “why is this result true?” You’ll still need to memorize some terms and definitions that you’ll use later – just as you need to learn the keywords of a programming language before you can program in it. However, it’s important to focus on the big picture. Rather than try to “memorize and apply”, try to “think critically and understand”.

You’ll see a lot of detailed information – definitions, proofs, examples, applications – that support the big ideas of this course. To get the most out of it, here are some suggestions for approaching the course material.

Learn together

Computer scientists have an undeserved reputation for being loners. In fact, computer science is a highly collaborative field, and computer scientists love to explore new ideas together. Remember that you’re not alone in this course.

If you’re having trouble understanding an idea, you should talk with your professor, coaches, and fellow students. It’s a good idea to study together, since explaining concepts to peers and hearing their explanations can help to clarify your understanding.

Know when to struggle and when to stop

It’s important to make a serious effort to understand the material and to work through the assigned problems. Always asking for help is an effective way to “complete” your assignments, but it’s a terrible way to learn from them, and it sets you up for failure on the exams.

On the other hand, there’s no prize for spending hours and hours hitting your head against a problem. If you’ve made a sincere effort to answer an exercise, reviewed the lectures and textbook, and you’re still not sure how to proceed, ask for help!

It’s up to you to learn to calibrate the right amount of perseverance – when to keep struggling and when to get help.
Take notes in lecture

While the slides from each lecture are posted to the course website for your reference, it still helps to take notes. Rather than write down what's on the slides or try to write down everything I say, put the concepts into your own words. You may find it especially helpful to draw diagrams showing how different ideas relate.

Also, pay attention to the questions other students ask and the answers to them. These won't be in the slides, but they may be the same questions you're wondering.

Start assignments early

If you leave assignments until the night before, you'll struggle just to finish before the deadline, which means you'll be working harder and learning less!

Start the assignments several days before they are due. The problems really benefit from going away and coming back later when you are stuck. And if you start early, you'll have time to get help if you realize there's something you don't understand.

Stay on top of the material

The concepts in this course build on each other. If there's something you don't understand, you need to make an effort to clarify it when it comes up.

I recommend you read the required material after the class where it is introduced. This way, you are reinforcing what you already understand with another explanation.

Focus on the main concepts and not just the details. For example, don't memorize each proof you're shown, but try to understand why it's written the way it is – how is the argument put together?

It's tempting to focus all your time on the current assignment, but previous misunderstandings will come back to haunt you! When your work is graded, go over it again. What should you do differently when you see a similar problem in the future? What did you misunderstand?

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