

Experiences of Successful Students

COMP 105

Spring 2017

To succeed in 105, you not only have to work hard; you have to work in the right way. This document presents the study strategies used by the COMP 105 students who earned the highest grades in the Fall 2016 semester: A or A+. (Not every student who earned an A or an A+ chose to respond.)

My success in COMP 105 came largely from acknowledging the demands of the questions and structuring my work around these demands. Problems in COMP 105 tend to have relatively elegant and simple solutions that become clear only once thought is put into them. I have found that the problems are best approached unrushed, calmly, and with a clear mind. To avoid the stress and tiredness of late nights close to the deadline, I did as much as possible early. Furthermore, when I was working, I found it useful to take breaks and come back to problems with a fresh mind when I started getting tired. I didn't try to push through exhaustion, and I stopped working before it got unreasonably late.

With regard to actually solving problems, I found it immensely helpful to first ask the question "what am I trying to do here?" rather than "how do I do this?". Taking the time to understand exactly what the question was asking before jumping in to attempting a solution made my solutions much less error-prone and as a result less time-consuming.

I avoided working in solitary conditions. A lot of the concepts are pretty confusing and the way a concept is presented in one source might be a lot more confusing than another. Working with other people helped me find alternate, valid explanations; it made my life a lot easier.

I learned most of the material by completing the assignments on my own and resisting the temptation of going to a TA or working with a partner. It was hard to keep up for the entire semester, but I liked the challenge and the experience was very rewarding. Working on the problems felt more like tinkering with fun projects and not like struggling through busy work for credit. . . well, most

of the time. It's very easy to fall behind with this approach, so I can't recommend it to everyone. In the department of "do as I say, not as I do," I would give future students these tips:

- Start working on the homework early. If you get stuck, ask for help.
 - Don't be afraid to skim through the huge textbook: sometimes you just have to find the right rule/paragraph and translate it into code.
 - Always test your code before turning it in; correctness is a big part of the grade.
 - Make sure to take a break every once in a while. Don't work at night when you're tired.
 - Don't cram for the midterm and final; as long as you do all your homework, you'll be fine.
 - Make sure your exam notes include samples of uScheme, Smalltalk, or ML syntax—it'll save you a lot of time.
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I started homework early. Figuring out problems and debugging is much harder when you are an hour away from the midnight deadline. And I wish I had used the TAs more. I really didn't use the TAs until the end of the semester, and I was surprised at how much time it saved. And, of course, I used an editor that keeps track of parentheses.

To succeed, I followed a relatively easy, sustainable path that included

- Being proactive (piazza, reading, asking questions)
- Reviewing homework before reading the book
- Allowing myself time to read and digest the material
- Highlighting or bookmarking textbook pages I thought would be useful
- Chipping away at the homework a little each day—*never* trying to do an entire homework at once.

- Meeting with TAs early—as deadlines loom, the TAs get progressively busier and busier
 - Focusing on understanding the ideas, not my grade—my grade is a byproduct of my understanding
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Before meeting with my partner, I skimmed the textbook. The book is big and bulky, but I earmarked important pages and I wrote down the page numbers of the big reference tables. These markers helped me work through the problem sets with far more understanding and ease.

Two big concepts I tried to focus on were understanding the programming-language theory and writing clean, concise code. If you're good at one but not the other, find a good partner (or two) who complements your set of skills. Whereas I found theory and proofs came more easily to me, my partner was far better at making sure our code was as concise as it could be.

Most importantly, do not lose faith in yourself. 105 is difficult and terrible at times, but completely worth it in the end. Good luck!

Here's what worked for me:

1. Before attempting to code a problem, I tried to understand it, at least at a higher level. Hack-and-slash may work for some courses, but that strategy won't get you far in 105. I was able to devise clean, elegant solutions by spending my time learning the concepts.
 2. I picked partners that I trusted and who had compatible schedules. You don't want to be stuck with someone who isn't as committed to the class as you are or who simply isn't available. I was careful to respect my partner's time: I arrived promptly to our shared workspace, and if I was running a little late, I let them know.
 3. I was *very* thorough with test cases. Every time my partners and I received excellent marks, it was because we took the time to write out all of the possible scenarios that our programs had to deal with. When making sure our components were behaving properly, we built slowly and tested exhaustively.
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Advice:

- Get help, connect with others, push back against this class when you need to, be honest with yourself and others, and breathe.

- For those of you who are dealing or could deal with loss during the semester like I did, I highly recommend getting accommodations from the professor (it's relatively painless) and talking to your alpha dean. It won't be fun but it will help.
 - Your partner is more than just someone who writes code with you. They are an emotional support. Be communicative, be open, be honest, be vulnerable. Make that relationship a loving and caring one.
 - If you drink coffee, bring a tin of instant coffee to Halligan so you don't have to pay a dollar for every cup.
 - Remember that the TAs are students and humans who have feelings and deserve to be treated with respect.
 - Don't be afraid to use your tokens early.
 - Rebind your large textbook into smaller sections so you don't have to carry the huge version all over the place.
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I think what enabled me to be successful in 105 was being in Halligan while working on the assignments. Apart from the help the TA's provided, it was easier to manage the stress and pressures of the course when I was surrounded by other people also struggling through the assignments. We shared ideas, but also joked around and formed a community, so going to Halligan to work on 105 didn't seem like much of a chore for me.

I started the homework immediately and worked on it a little bit every day.

Some homeworks took me significantly more time than others—find out from TAs or past students how the current homework compares in time commitment to past ones. That helped me budget time between 105 and other classes.

Going to class is essential. We got a lot of helpful information that was difficult to find in the book if you didn't know what you were looking for. Recitation also provided good hands-on practice.

Manage your time well, and before you jump into the homework, put in the time to understand the material (at least on a basic level).

Form a study group of about 5–6 other people, and collaborate on the homework throughout the semester. I wouldn't have been able to succeed without a study group and also going to office hours frequently.

I was continually confused, and I often felt like I had no idea what I was doing or why. But so long as you are trying (go to class, attend most recitations, ask questions during office hours), you absolutely will be able to do the homework and the exams.

I used the book wisely: I skimmed through it first, and I marked pages with important-looking tables. I read more closely only when I found a section containing things that seemed familiar from class.

What helped me the most was a positive attitude. Staying positive had more impact on my ability to succeed in 105 than any other tip.

To make a forced comparison, 105 is like international travel. At first, there is culture shock—characters, symbols, and languages you’ve never seen or heard. But as you become a more seasoned traveler, you recognize similarities between different languages, and you learn tricks to pick them up more quickly. Furthermore, becoming a more experienced traveler will help you not only succeed in learning new languages, but also will improve your ability to use languages you already know.

It also helped me to read the assignments early and to set aside blocks of time during normal hours of the day, while I was alert and not longing for sleep. These tactics made the course much easier. I won’t be the last to say that 105 does not reward students that tap away at the keyboard late into the night. I found that working while I felt alert was far more fruitful.

In my other CS courses, I didn’t have to look at a book, but in 105, learning to navigate the textbook helped me immensely. In 105, you must not only read the textbook but also learn how to use it. (I refer to the book as “the world’s most complex answer key.”) Once I learned to find my way in the book, I had many fewer head-scratching sorts of questions that I would otherwise have had to wait to ask a TA about.

In 105, I had to learn to be comfortable in situations where I didn’t completely understand everything. Given the complexity and pace of the course, it’s difficult to produce assignments and descriptions that are crystal clear to every single pair of eyes. Don’t be frustrated by not understanding or knowing something; instead, recognize the fact that if you’re struggling, other students are probably struggling with the same issue. It helped that I spent time in Halligan’s collaborative spaces, and I got to know my fellow students and TAs. At first it seemed like there were a lot of students in lecture, but by the end of the semester, I had interacted with most of them. Collaboration (within the course rules) was crucial to my success.

My success in 105 came from continually using each resource until I understood how to solve the problem presented in the

homework. That means starting with the lecture notes, looking for help from the textbook, discussing the problem with peers, and going to the TAs for clarification or guidance. It helped me to start the homework the day or two after it was assigned, because the initial hump of understanding the problem is the most difficult. Trust that you will figure it out. Even if it seems like other people understand the problem better than you, everyone started in the same place of having no idea what to do. The coursework took me a lot of time, but finding people to work with and TAs to help me made it manageable.

I found that 105 does not benefit from long (more than 2 hours) sessions of coding—most of the assignments are rather short but are hard to figure out what to do. I think assignments in this class are like geometry puzzles. Once I “saw” the solution, I you could go “*obviously* it has to be done like this,” but seeing the solution took time and experience. I found out that if I started the homework as it was released, I had much easier time solving it. Working on the question each day for at least little while was really helpful.

The second thing that worked for me (especially for the final assignments) was coming together with fellow classmates at collaboration room and studying the topics we had seen in class together, asking about parts I didn’t get, and bouncing off ideas from each other. COMP 105 is not an easy class and working alone only makes it harder. Even if you make no progress, you will have companions.

Finally, I picked my battles. COMP 105 helped me *monumentally* to grow as a computer scientist, and it introduced me to intellectually very interesting ideas (such as different methods of how computing can be conceptualized and how languages bring about those concepts). But COMP 105 is also sprinkled with what I can only describe as “exercises in tedium.” It helped me to skim over them and not give it much thought other than what I got in lecture. I think I didn’t miss much.