

HOW TO SUCCEED IN CSCC73

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I define success in this course to be mastering the material to a degree that will enable you to solve new problems efficiently, using the algorithmic techniques taught. If you work effectively towards this goal, you will perform well and earn a good grade.

A necessary condition for success in this course is to devote sufficient time to it. The time a student needs to master the material depends on the individual, but a typical student should plan to devote 10-12 hours per week to the course, *every week* of the semester. This includes the four hours needed to attend the lectures and tutorial. I emphasize “every week” because the subject matter does not lend itself to cramming: You need time to engage with and absorb the material in the ways I describe below.

Devoting enough time is a necessary, but not sufficient, condition for success. In the rest of this note I will suggest how you can make *effective* use of your time.

1. Before the lecture. The most important preparation before each lecture (other than the first one!) is to review the previous lecture. This is because a lecture often builds on concepts introduced in the preceding one. It is therefore important to come to class fully caught up (see item 3 below).

In addition, you will get more out of a lecture if you have some idea what it is about. So, if possible, it is useful to familiarize yourself with the topic of each lecture in advance.

The weekly schedule on the course web page gives fairly detailed information about what I plan to cover in each lecture, and where you can find this material. Skim the relevant section in one of the textbooks before the lecture. *Your goal at this point is only to familiarize yourself with the topic*, not to understand the algorithms to be presented in the lecture — let alone why they work, or their running time analysis. The fuller understanding will come during and after the lecture (see items 2 and 3 below).

2. During the lecture. Pay attention, take notes, ask questions. Don’t get distracted or distract others — so, just before the lecture starts, turn off your mobile and the wifi on your laptop. Lectures are very compact; if you miss a key definition or remark, you may find it impossible to pick up the thread of the argument later on.

3. Soon after the lecture. Carefully go over your notes and over the assigned material in one of the textbooks. As a student, I found it useful in some courses to reorganize and rewrite my class notes into my “official” course notebook. This allowed me to review the material and make corrections to my notes while the lecture was still fresh in my mind.

You are not merely reading, you are *studying* — and this requires a more active engagement. You need pen and paper to sketch out ideas, create examples, draw pictures, work out detailed calculations, etc. You need to do this in a quiet environment with no distractions: no texting, no listening to your ipod, no TV, no web- or video-surfing while you are studying. You need sustained focus for this effort to pay off.

It is OK to study in (small) groups, as long as the group isn’t a distraction but a resource to help you answer questions. In fact, a (small) group can be helpful not only because you will have some of your own questions answered but also because it will afford you the opportunity to answer other people’s questions. Nothing helps understanding a subject better than explaining it to someone else. I learned more as a

teacher than I did as a student. (In connection with study groups, however, take note of the course policy on homework collaboration.)

Make sure you understand *everything*. Jot down anything that is unclear and return to it later on your own; if you cannot understand it on your own, ask me or post a question on the course forum.

4. Do the homework; start early. Homework assignments enhance learning in two ways: One is by exposing gaps in your understanding. If you are unable to do a problem, you need to reflect more deeply on it. You may well need to go back and study more carefully the material on which the problem is based. The second way in which homework assignments enhance learning is by having you actually *use* your newly acquired knowledge to solve new problems — the definition of success in this course. This requires a deeper level of understanding and is a form of the much venerated “experiential learning”: learning by actively doing.¹

The assignments are designed to be reasonably challenging; they are not meant to be routine exercises, and they cannot be completed in a short period of time. ***A typical student should plan to spend three to four hours per week on average on the homework assignments.*** (Note: this is per week, not per assignment!) It is therefore important that you start working on each homework assignment as soon as it is posted.

You will be given two to three weeks to complete each homework assignment. The pedagogically correct strategy would have been to give you a shorter homework assignment each week, rather than a longer one every two to three weeks. Experience, however, suggests that this creates bottlenecks for you because (unlike this course, where workload is fairly uniform throughout the semester) some other courses have peaks and troughs in their workload. The longer period for completing the homework allows you to plan your time and dampen variance in your workload. Unfortunately, this longer period also creates the opportunity to leave your homework for the last minute. ***Resist this temptation through careful planning and allocation of your time.***

Don't start working on your homework until after you have completed item 3, i.e., until you have studied carefully the material on which the homework is based. Failing to heed this advice is a surprisingly common mistake. It seems like an expedient shortcut (“I will study only what I need to get this blasted homework out of my way”) but it is counterproductive and ultimately wasteful. You are very unlikely to do a good job on a homework assignment if you haven't studied the material on which it is based; moreover, you are unlikely to identify the minimally necessary material to solve a problem you have not yet solved.

As per the course policy, you may work with a partner on homework assignments. ***Don't share the work by dividing the homework in two and having each partner do half of it.*** Doing so will cheat you out of half of the above-mentioned benefit of doing homework. Instead, each partner should initially work on all problems alone; after an honest first effort, you can get together with your partner to exchange ideas and try to make progress on the parts that you were unable to get on your own.

5. Seek help when you need it. I am here to help. If you don't understand something, don't hesitate to ask. I will not judge your intelligence or your course performance by the questions you ask, so don't let such inhibitions get in the way of learning. In-person interaction during office hours or by making an appointment is the best way to get help. The Piazza forum is another option. Email affords neither the immediacy of in-person interaction nor the efficiency of Piazza's multi-party interaction; it should be used only when the other two options are not available.

My answers to your questions may well take the form of other questions or of advice as to what to study again, more carefully. This isn't because I am too lazy or too coy to give a straight answer, but because arriving at the answer by yourself with some guidance puts you in a better position to attack a new problem than simply being handed the answer.

¹“I hear and I forget; I see and I remember; I do and I understand.” —Confucius