

Student Study Tips

by

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These study tips have been compiled as part of a continuing research project looking at the transition from high school to university, with a particular focus on students enrolled in first-year chemistry courses. They are based on the data from interviews, focus groups, the educational literature, and the personal reflections of the 2007-8 team members. We hope that other students find these helpful - especially those just starting out in first year! You can find out more about this 299Y Research Opportunity Program study at the following web site:

<http://www.chem.utoronto.ca/~dstone/Research/ROP299.html>

Study Tips
(Compiled by the CHM299Y Chemical Education Project Team)

Learn

Studies have shown that even the best note-takers get only part of the content delivered in a typical lecture. Go over your notes with the text, and expand what you have written; also check for transcription or notation errors, and fix these before proceeding.

You will need to know basic terms, rules, procedures, and principles. You will be given some equations, but you will still need to know what the symbols represent and the correct units to use.

Understand

Basic memorization will get you started, particularly with factual knowledge and simple calculations. Getting the same answer as provided in the text or solution manual does not necessarily mean you have understood the material, however, and can lull you into a false sense of security.

Ask yourself the simple question, "Am I confident that the answer is correct, even *without* looking at the solution?" Do you understand *why* a particular procedure is used to obtain the solution? Can you identify the underlying principles and theory behind the solution?

Explain

The true test of understanding is the ability to explain it to someone else *in your own words*, without simply reciting textbook definitions. This is where study groups can be a great help, as they give all participants an opportunity to challenge their own understanding.

Connect

Current educational and neurological research suggest that true learning happens when individuals construct knowledge for themselves into connected *schemata* ... connections! Try to find connections between the concepts that you are learning in order to categorize your knowledge as well as better understand the bigger picture.

Practice

Practicing problems is extremely important. Challenge yourself by attempting the difficult questions that require knowledge application. Ask your professors or TAs where you can find additional problems to practice that have the difficulty level of a midterm test or exam. Use past midterm tests and/or exams as additional homework problems - these will help you better understand the types of questions that will be asked and train you in becoming an effective problem solver.

Prepare

There are two types of learning that can occur in a classroom: *active learning*, and *passive learning*. Whereas *passive learning* involves rote note-taking and transcribing what the instructor is saying, *active learning* involves the student having come prepared for lecture with a basic understanding of the lecture's contents. This will help the student identify what area he/she will need to focus on during class time.

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Ask

Use your resources! There are many outlets on campus that can help you with course material should you experience any difficulty. Your most accessible resources are your professors and TAs. Be sure to visit your professors during their office hours to clear up lecture material that you are experiencing difficulty with as soon as you experience this difficulty. Clear up any issues **as they arise** - do not wait until right before the exam to do so, as certain concepts are meant to build on each other.

Become friends with other students in your lectures, labs and tutorials. Forming study groups and asking each other for help gives you the opportunity to deepen your own understanding of concepts by explaining them to peers. Together, it can often be easier to figure out a problem.

Organize

Organize your study routine in such a way that you will be able to keep up with your course work despite tests and exams. While it may be difficult to not fall behind during midterm season, it is of utmost benefit to allot some of your time each day to keeping up with courses in which you are not being immediately tested for. This will in effect save you time and prevent you from 'cramming' the material of the course a day or two before the exam. Five 1-hour study sessions will result in greater recall over a longer period than one 5-hour session the night before the final!

Study Smart

Few students are able to memorize a whole semester's worth of notes for five courses inside out within a short time period. For some courses, such practice may actually be unnecessary. Know what study methods are suitable for certain courses. Some material is best assimilated through constant practice rather than rote memorization. Some material requires memorization and may be internalized with mnemonics or chunking techniques. Past test papers can especially help guide you on appropriate study methods and plan **efficient** studying.

Likewise, know what study methods are suitable for **you**. All students are responsible for the same material, but not all students study the same way. Some students are visual learners and easily make connections by illustrating their subject material in a spatial context. Some students separate topics into discretely categorized chunks for convenient retrieval, while others prefer to amass all topics while applying basic concepts to all scenarios.

Refuel

Just as important as the study method itself is the maintenance of a healthy lifestyle conducive to efficient studying. Many students acknowledge experiencing phases of "diminishing returns" after excessively long periods of studying, whether it is due to distractions or learning capacity. Take a break regularly.