

Working smarter in Science

Studying more effectively

Most students begin their Science degree with good intentions to work hard and achieve good marks. Yet, some students work hard and still do not progress well. Long hours spent studying in the library or at your desk don't necessarily equate to quality learning.

It's important to be strategic in your studies and to work smart as well as hard.

Exams at university require you to demonstrate your understanding of concepts by applying your knowledge to a specific problem or scenario. This encourages deeper learning rather than regurgitation of knowledge. If your current study techniques focus on surface learning strategies such as memory retention (rather than application), you may need to change your approach and use more active strategies that will help you understand the material (see the Academic Skills Unit flyer on **Active Learning**).

The following strategies may help you to study more effectively.

Look at the big picture of your course

It is very easy to become overwhelmed by both your study workload and extra-curricular activities and to slip into a pattern of drifting through a course.

Having an overview of how your course fits together as a whole can help you work smarter. Focus on the objectives for each of your subjects. Examine your course outlines carefully and try to determine how the topics fit in with the course objectives. Ask yourself:

- *What are the key issues or content areas in this subject?*
- *What am I expected to be able to know or do by the end of the course?*
- *How do the different topics relate to each other?*
- *How do tutorials or lab classes link with lectures?*
- *What skills do I need to demonstrate in assessment tasks?*

Focus on the important stuff

The majority of the assessable material for your subjects is presented in lectures, so this should be your key area of study. In Science subjects, where your exams may be worth up to 70% of your marks, preparing for and reviewing your classes is the best way to spend the bulk of your study time.

Taking time to prepare for classes is a study strategy that is not necessarily time consuming. Quickly skim read designated book chapters, articles or lecture notes (which are often available on your department LMS site) and check your course outline at the beginning of every new topic.

This will enable you to develop some context to help you better understand what you are about to learn. You will gain a better idea of how the lecture content might be organised and what some of the main issues are. You will also become familiar with some of the new terms or concepts that may be introduced.

If you don't have time to implement any of these strategies, try to arrive at the lecture in sufficient time to re-read your previous lecture notes so that you have some context for the new information you will hear.

Review actively

Regular reviewing of material will enable you to monitor and consolidate your understanding. If you don't understand a concept after a lecture, you are unlikely to understand it any better in 'Swot Vac' without prior revision. Some active revision strategies are:

- asking questions about the material,
- thinking about how it relates to what you already know,
- annotating your notes, and
- highlighting challenging concepts or problems and allocating time to work on these.

Ideally, do your revision on the same day as the lecture. Try to review all your classes before you leave campus for the day. If you fall behind and daily reviewing becomes too onerous, then review at the end of each topic.

Don't be tempted to leave revision until 'Swot Vac' as there will simply be too much to learn in this short period of time. If you are really having difficulty with a particular area of the course, follow it up with a fellow student or your Science tutor.

If you keep up with your course and spend time consolidating your understanding of content material, you will become more engaged with the subject and find it easier to complete your tutorial or problem sheets.

Academic Skills

Practise the skills that will be assessed

In Science, you practice applying your skills in pracs, labs, and tutes. It is essential that you complete your problem sheets or online tutorials each week as these tasks are similar to those you will face in the exam.

If you can't complete all the problems because you find them too difficult, consider working collaboratively with other students. Organise a study group or work with a friend. Fellow students are frequently good sources of information and may be able to help clarify difficult concepts and applications.

Ask for help if you need it

There are a number of things you can do if you're falling behind or don't understand course material. Even if you are not in first year, you could attend one of the Learning Centres in Chemistry, Maths, Biology, and Physics to talk to a lecturer or tutor: they are interested in your progress. In addition, you can make an appointment to see an **Academic Skills Adviser** to review your approach to your studies.

Keep your assignments in perspective

All your Science subjects will require you to complete assessment tasks. Working on these tasks is another opportunity for you to learn content and to practice skills in the subject. Keep in mind that some tasks may only be worth 15% of your marks, so allocate your time according to their weighting. Your exams may be worth 70%, so you need to keep up the process of regular review and consolidation of material.

Use your time effectively

Most students juggle sport, work, social, and family commitments in addition to their studies. These activities all make a valuable part of the university experience, but you need to balance the time you spend on them with studying. Remember, the workload required to complete a full-time degree is similar to that of a full-time job.

Diaries or weekly and daily 'to do' lists are useful aids to help you stay on track, stick to a plan, and keep up with your workload. Whatever system you use, listing tasks in writing is a form of commitment to completion.

Make a timetable that works for you

Provided you use it flexibly, a timetable listing all of your commitments for the week may help you stay on track, and identify how much time you actually have available to study. A semester wall planner or calendar showing all of your assessment tasks and tests in each subject may also help you identify and plan for busy times when assessment tasks overlap.

Whatever course you study in Science, there are routine tasks which you need to complete each week: preparing for lectures and tutorials; preparing and/or completing labs or pracs; completing problem or tute sheets; completing online tutorials; and reviewing your lectures. Ideally, you should list all of these tasks on your weekly timetable and semester planner. Estimate how much time each task will take you to complete it. Allocate time weekly to each subject and allow extra time for more difficult concepts.

Use smaller rather than longer chunks of time for study

There is a common misconception that you need a large spread of uninterrupted time to achieve worthwhile study. However, many tasks fit quite well into the one hour time slots between classes. You can use this time to read or review your lectures, prepare for a prac, complete one or more problems, or complete an online learning task.

Manage procrastination

If you find yourself putting off working on difficult tasks, try to break them down into smaller, more achievable components, or work with others to improve your motivation.

Minimise distractions by turning your phone off or by allocating specific times for diversions, such as playing games or checking your Facebook page.

Consider your energy levels and work preferences and think about your optimal conditions for concentration.

- Do you work more effectively at home or in the library?
- Do you work better alone or do you like to brainstorm with others?
- What time of day is your best time for deep concentration?

Try to organise your study routine around these preferences to maximise effectiveness.

Finally . . .

Learn to **prioritise**. You may not have time to complete every task on your to do list, but you can always do something.

By implementing some of these strategies and keeping up with your course work, you will become more engaged with your studies and your motivation will improve.

What is your priority task today?

Further Resources

Cottrell, S. (2008). *The Study Skills Handbook* (3rd ed.). New York, USA: Palgrave Macmillan.
Rhoden, C., & Starkey, R. (1998). *Studying Science at university: everything you need to know*. St. Leonards, NSW: Allen & Unwin.

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