

# Doing Biology

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*Science majors quickly discover that success requires active participation in their own education! The following essay was written by a senior biology major serving as a preceptor for a freshman-level course. It has many valuable suggestions about how to break out of the “Listen-to-Lecture, Cram-for-Exam” trap and start doing biology.*

## **Yes, you CAN get good grades as a science major!**

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The first thing to know about the science classes is that you really do have to know all the material covered in lecture backward and forward, inside and out. This might not have been necessary in high school, and perhaps it isn't even essential in some other college courses—but in science, it is! Your test scores can shock you if you're not prepared for this. But don't worry! Just prepare for it in advance.

The second thing to know is that if the information is not settled into your *long-term* memory, you will not remember things well enough to *apply* the info to *new* situations—and that's exactly what your science professors will ask you to do.

Two of the best things you can do for yourself are: (i) *want* to learn the material—find what's interesting to you about it even if it's not your favorite subject—and (ii) start thinking of teachers as assistants who are helping *you* teach *yourself*. College requires autonomy. If you are a science major and your science classes seem too hard, consider whether you really, honestly want to study science. It gets harder from here—but more rewarding, too!

## ***In class***

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- ▶ Take complete notes.

If it's a choice between getting everything down and understanding it the first time you hear it, just get everything down. It'll help you understand it more fully when you study it later on. Use abbreviations (b/c = because, w/ = with, fxn = function...).

Include pictures in your notes. Put a question mark in the margin when you don't understand something—either something you want to ask about in class or something you need to put extra study time into later.

Don't just write what the professor writes on the board! What s/he *says* may be crucial to understanding. Don't rely on your memory. Even writing down a joke or a silly analogy might help you remember a key point.

- ▶ Prepare in advance.

Studies show you learn more when you have some idea of the subject matter before trying to learn it. Most professors give reading assignments in advance. Some put their lectures or outlines online or hand them out before class. Use these to help you get ready for the lecture, and you'll take better notes and remember the material better later.

- ▶ Ask questions.

If you have a question, other people probably do, too. They're more likely to be glad that someone asked than annoyed at the interruption. Remember the professor's goal is to help you understand...s/he *wants* you to ask questions!

- ▶ Make connections.

Relate lecture subjects to one another and to previous lectures. Take out your notes; have them handy in case you want to look something up.

- ▶ Don't skip class.

It's really not worth it! But if you're very sick and absolutely have to stay home, get the notes from someone else ASAP and talk to the professor about anything that's not clear.

## After class

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- ▶ Keep up with the material.

There is simply TOO much information to try to learn it all at the last minute. Most of us have tried it at some point—trust us on this one! We have to make an extra effort because we learn a semester’s amount of material in 10 weeks at NCC.

- ▶ Schedule your assignments and projects at the start of the term.

Put everything down on a calendar so you always know when everything is due. Try a big one so you can see the whole term at a time. When lots of due dates pile up, that’s a sign that you need to work *ahead* on some of them.

- ▶ Get help.

You want to be challenged, but you don’t want to struggle needlessly! Get help before it gets to that point. One of the greatest things about studying science at NCC is that the professors are available to help you personally, and they want you to succeed just as much as you do!

## Organizing your time

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*There are 168 hours in a week. Of these 168 hours, you will be asleep for about 60, dressing and eating for about 20. If you take Saturday afternoon off for a hike, consider Sunday morning and afternoon as time off from studying, and have two four-hour dates a week, you have about 68 hours a week for schoolwork. If you are in class and laboratory for 20 hours, you still have 48 hours for study! It seems like a tremendous amount of time, doesn’t it?—especially considering that you’ve taken off half of Saturday and most of Sunday. Just where does all the time go? A great deal of it is lost in ten- and twenty-minute idle discussions, time wasted during the twenty minutes while you wait before a class after you’ve needlessly spent another twenty minutes walking to the post office and back for a stamp you could have picked up just as easily on your way back from lunch, and so on. It is up to you whether you want to make good use of these numerous ten-, twenty-, or thirty-minute intervals. I’m not urging that you never take a minute off to enjoy life, but there is certainly little danger that you will use your time too efficiently.*

— S. Chapman

- ▶ School IS a full-time job!

Studies show students who work may not do as well as students who don’t. If you have a job, try to work as few hours as possible. Science classes genuinely require 15-20 hours a week of studying, and maybe more for researching and writing lab reports. Decide whether you really need to work to pay for school, or if you’re just working for luxuries or to reduce your loans by a few hundred dollars. If you must work, consider an on-campus job; they’re very flexible with our schedules. Scholarships and grants are available, too.

- ▶ Know yourself.

If you know you tend to get distracted in the evening, or sleepy after lunch, or disorganized after a while, take those things into account when setting up your study schedule. If you know you tend to read slowly, try getting up earlier in the morning, before the day gets too busy.

## Study tips

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- ▶ Study when you're rested and alert.

For most, that’s morning or late afternoon/early evening.

- ▶ Take short breaks.

Studies show you learn more when you take short breaks after 20-30 min. Also, study a lecture for 3-4 consecutive days, then take a break and coming back to it. This helps move the info from short to long term memory.

► Study actively.

Remember you're not just studying in order to fulfill an assignment, you're studying to understand the material. Don't read or recopy your notes passively. The key is to hold yourself accountable for what you're studying—if you don't, you have no incentive to remember anything! After a study session, quiz yourself in as many ways as you can.

► The textbook is a valuable friend!

Read the text slowly enough that you really understand what you're reading. If you're not "getting" any of it, it's a waste of time. Go back and read something again if you need to.

Don't be afraid of reading or learning more than you need to. When you "overlearn," you find that you understand the basic concepts—which are probably what you're supposed to learn—much better, because now you have a sense of them in a greater context. So skip ahead in the chapter, or continue reading into the next section if you have time.

Look at the chapter outline. Take note of the section titles. These are main points. Science texts aren't meant to be read the same way as novels. Be sure to look closely at the figures and read their captions.

Draw out the illustrations and processes that are in the pictures or in the text. Draw them out from end to beginning, or backward as well as forward, to make sure you understand them.

► Get focused.

Don't sabotage yourself with a distracting environment. Moving into a quiet room to study makes all the difference in being able to focus. Turn off your phone and the TV.

► Take care of yourself.

Think of sleep as a necessity, not a luxury. Even a little bit of sleep deprivation hurts your brain, because your whole body has to move into "survival mode," and it's harder to concentrate and remember things. Studies show that sleep is important for moving info from short- to long-term memory.

Stay hydrated. We know now that even a 1-2% drop in body water affects your learning ability. Eat something before coming to class—it gives your brain the energy that it needs. BUT, don't have a lot of sugar: you need constant energy, not a sugar high followed by a coma.

If there's a problem in your personal life that's affecting your ability to focus and study, talk to someone: family, friends, RA, Hall Director, academic advisor, professor, doctor, psychologist—no one's saying college is a piece of cake, and they all want to help you if they can.

**Don't equate working hard with being hard on yourself.** Most worthwhile goals take real work. If you're a procrastinator, this is the time to start helping yourself be more effective at self-management. Discipline is the opposite of procrastination. When we're young, discipline is thought of as the same thing as punishment, but for an adult, discipline is a gift you give yourself, a way of showing respect for yourself, to actually do what you intend to do. You ARE capable of learning what you intend to learn, and getting those As—be sure you're not psychologically blocking yourself from it.

