

STUDY SKILLS TO HELP YOU BE SUCCESSFUL IN THIS COURSE

While there is no substitute for diligent study habits, each of you will approach biology and/or your biomedical studies from a different background each with your own unique views of the world and individual abilities. All of us do not view the world the same way and thus we do not all learn in the same manner. Some students prefer essay exams while others are more proficient at objective tests. Some of you are visual learners; some of you are more verbal and like to discuss the material out loud, while others are more adept at rote memorization and conceptualization. What follows below may seem verbose, but it is a series of suggestions designed to help you take in, organize, and assimilate the information presented in this course as well as suggestions for improving your performance on exams, quizzes, and written assignments. You may discover a study technique of which you were not aware.

• GETTING THE INFORMATION

1. ATTEND CLASS

If you are not present in class, then you simply cannot get the information at all. You will not effectively succeed in this course if you miss class or if you try and get the information from another student's notes. Since we all assimilate information differently, we all take notes somewhat differently and thus someone else's notes are not going to help you much. Your notes should be used to help you recall what was discussed in lecture or lab. If you are absent, then you will not have any information to recall. Keep up and study regularly!

2. READ THE BOOK AND LAB MANUAL BEFORE EACH LECTURE OR LAB

For many of you, the material, which is presented in lecture, may seem complicated and difficult to understand. Much of the information you receive in this class will be new to you and it is important that you at least skim the text and read the lab manual before coming to class so that the information is not totally foreign to you when I discuss it. Your text is full of diagrams and illustrations, many of which I will use in lecture and/or lab to help you understand the material. Of equal importance is the fact that your text provides you with a different perspective on the material.

3. PUT THE INFORMATION ON PAPER

Many students fail to succeed in their courses because they do not take meaningful and useful notes. To begin with, you must pay attention and not wonder off to Never-Never Land during the lecture. It is important that you keep yourself focused. I will do everything I can to keep your interest, but it also requires you to concentrate on the lecture and not on the students around you. Remember that these are NOTES, you aren't expected to and you should not attempt to write down every word I say or write out your notes in complete sentences. Your notes should be a complete outline of the information presented in lecture. My lectures will include the use of the chalkboard, overheads, 35-mm slides, PowerPoint presentations, and the World Wide Web. This means that there will be times when I am talking about a slide or overhead, but I am not writing everything on the board. You should be taking notes as I speak and not simply writing what I write on the board or overhead. It is important that you write down more than what I write. I guarantee that I can talk faster than you can write, but you will hear everything I say. As soon as possible (within a few hours) after each lecture, you should review your notes and fill in details that you remember but you did not write down. Try to get together with other students in the class as soon as possible after lecture to compare notes so that you can fill in "missing gaps" in each other's notes. If you are not sure about a subject or have questions on a topic, write yourself a note in the margins of your notes and come ask me about it during office hours or after lecture. *Feel free to bring a small tape recorder to lecture if it will help you, but do not become dependent on the tape. Write your notes as if the recorder wasn't even there.* Yes, there is a lot of information presented during this course, but with a set of good notes, it won't seem so daunting.

4. USE THE HANDOUTS TO YOUR GREATEST ADVANTAGE

You will receive handouts and some notes taken from sources other than your text and the lab manual. These handouts and notes are meant to help you make sense of difficult topics and aid you in your studies. Write notes on these handouts as we discuss them. Use the diagrams from the handouts and your text to help you visualize the information and quiz yourself. This will help you better recall the material during the exams and quizzes.

• ORGANIZING AND ASSIMILATING THE INFORMATION (A.K.A. LEARNING)

1. STUDY, STUDY, STUDY!!

I have been a student myself for many years and I am excited to continue to learn about the world around me for the rest of my life. I understand that learning is not always fun, it takes work and dedication. Put simply, the only way to be as successful as you can in a course is to work as hard as you can. There is a direct relationship between the amount of time and energy put into your studies and your grade. Regardless of how they learn or why they are taking this course, most students perform well because they strive to learn the material. Don't "worry and fret" about your grade, as you will only succeed in wasting your precious time and possibly giving yourself some sort of gastrointestinal distress. You are much better served in expending your "worry energy" in your studies. Keep up with the lectures, if you fall behind you will become more anxious, confused and frustrated. Study regularly and early in the semester. The all-nighter approach is a very difficult one to pull off so that you succeed in getting the grade you know that you deserve (the highest score you could possibly earn). There is simply too much information presented in the weeks of lecture before the exam for you to assimilate in the one night before the exam. Read, study, prepare, and discuss the information regularly, then you will not only learn the material, but you will decrease your level of anxiety before and during the exams.

2. BE AN ACTIVE, NOT PASSIVE LEARNER

The greater the variety of senses which you utilize to take in the information which we discuss, the easier it will be for you to remember and use the material. Simply reading the text and repeatedly looking over your notes will not ensure that you perform well during the exams. Below are some suggestions to assist you in studying and assimilating the material.

A. DRAW LOTS OF PICTURES AND DIAGRAMS.

You do not need to be a Michaelangelo to doodle. We aren't looking for great pieces of artwork here. Biology is a visual science and drawing schematic diagrams of the material will help you learn. After studying your notes, the text, and the handouts, draw illustrations and try to label them without referring to your notes. Then use your notes and the text to check whether or not you really know the material. Draw a series of diagrams without names and labels that you can use to quiz yourself. While this may take some time, it will go quicker than you realize and may actually make learning the material a bit more fun for you. *Generally, I have found that simply covering up the parts of the diagrams in the text is not a useful way to study. There is a tendency to "let your hand slip" and give you a false sense of what you really know and don't know.* By drawing everything out on a separate piece of paper, you can't cheat yourself and will learn the information more thoroughly.

B. KEEP YOUR STUDY MATERIALS ORGANIZED

As we proceed through the course and you begin to amass the information, keep it in order. Write the date on each of your lecture notes and handouts and keep them neatly organized in a binder or notebook. You may find it useful to make outlines from your notes to further simplify and organize the information. Write the date of the lecture on each of the handouts that you get and either keep them in order or together with the lecture notes from the same date. Save all your quizzes and exams together to review and to keep track of your score during the course (a good idea for all of your courses). Each of us organizes a little differently, whatever your unique system is, stick with it or you will become lost in a sea of biological terms and concepts.

C. TEST YOURSELF – THIS PART IS REALLY IMPORTANT!!!

You will greatly reduce your level of exam anxiety if you test yourself before the exams and quizzes because you will be aware of what you know and what you don't know. Many students like to make flashcards to help them study for exams. These can be useful, as they require you to rewrite the material, both as a question and as an answer and spend time with the information presented in class. However, many students have neither the time nor the inclination to make flashcards. Be careful of spending too much time making flashcards and cutting short the time you have to study them. If you feel you do not have the time and would like to utilize your precious and limited study time more efficiently, I offer another alternative outlined below (it doesn't work for all students, but many have found it helpful). As you go over your notes, make a list of self-test questions on separate pieces of paper and note the lecture date from which the information came. For instance, if you read that living things are broadly classified or grouped into one of five kingdoms, you could write on your list of self-test questions, "What are the five kingdoms of life?" and the lecture date or text pages numbers that refer to this question. Then, you can study these questions and learn the material effectively. *You will learn the material very well if you write a short question for every bit of information presented in class. Therefore, when*

you know the answers to all of these questions, you know it all. If you don't know the answer to a question, simply look up the lecture date or text pages to review the answer. Using this technique, you don't have to write down all of the questions and all of the answers, just the questions. As you go over the self-test questions you will become aware of the areas in which your knowledge is strong and in which areas you are weak. Since you only have a limited amount of study time (after all you do have an entire other life besides this course), you can then concentrate on the questions and topics that you don't know well. Each time you review your study questions, put a check mark next to the questions to which you know the complete answer. Do not mark the question if you do not know the complete correct answer. As you repeatedly review your list of questions, you will realize that the questions that have many check marks cover material that you understand, you can then concentrate your studies on those questions which have few or no check marks. This allows you to better utilize your study time and helps prevent you from studying material you already know. These questions can also be used in your study group or you can get a friend or helpful relative to quiz you. This is a great way to study as your brain studies the information via your ears in addition to your eyes.

D. USE MEMORY DEVICES FOR COMPLICATED TOPICS WHEN THEY ARE HELPFUL TO YOU

A mnemonic device is a phrase that has some relationship to the material you are studying that will help you remember the information. Such devices are often used to memorize lists or categories of information. For instance, the phrase, "King's Play Chess On Fine Grain Sand" has often been used by biologists to remember the various levels of organization into which all life is classified. The first letter of each word stands for a level of classification (Kingdom, Phylum, Class, Order, Family, Genus, Species). Be creative and use phrases from your own experiences that you know you will remember. Students often remember mnemonics they have invented for themselves better than those supplied by an instructor or tutor.

E. GET INVOLVED IN A HARD WORKING STUDY GROUP

Get to know other students in the course and maybe make a new friend. *I suggest you get the phone numbers of at least three other students in the class.* Surround yourself with reliable study partners who push you to do your best. Organize regular gatherings of a group of fellow students to discuss and study the material as well as quiz one another in preparation for exams and quizzes. Exchange study hints, mnemonic devices and encourage each other. If you get discouraged, a good study group can help boost your confidence, keep you from feeling isolated and motivate you to succeed. Talk to each other about the information. *You will be much more prepared for the exams if you have to discuss or explain the material to someone else.* The more times you hear and talk about the information the more likely you are to remember it. A good study partner is one who pays attention in class, who is prepared ahead of the study time session and one who can explain the information to you so that you understand it or help you correct imprecise information that you may have in your notes. If there is a discrepancy between your notes and the notes of a study partner, come talk to me so that I can clarify the material for both of you. Some of you may study more efficiently on your own and if you are one of these people you might be able to assist your classmates. Remember, the key to studying effectively is not just learning, but learning efficiently. Make the best use of your time. *Thus, you should be aware of study groups that will do you more harm than good and actually could cause you to receive a lower score than if you had studied alone. Avoid study groups in which the individuals in the group constantly complain (they are wasting your precious study time!)*

FREQUENTLY HEARD COMPLAINTS AND STATEMENTS FROM USELESS STUDY SESSIONS:

(and my responses)

"The instructor sucks!" or "The instructor is a @\$%^&*!" – a personal opinion to which you are entitled

"This class is too hard!" or "There is too much work in this class!" – I hope not, you can all get it, ask me for help

"The tests in this class are unfair!" – only if you haven't studied, otherwise I am more than fair.

"We don't really need to learn all this biology, we're never going to use it." – you might be surprised by how much of this information already plays a role in your everyday life – let alone the 21st century.

"I just want to pass this class." – this is your prerogative, you can all do better than simply passing

"Have you seen the cute blonde (male or female) that sits near the front!?!?" – try not to get distracted

"The instructor needs to buy some new clothes." -- probably

"This class is too difficult, it's not like this is graduate school!" – I hope not, it's why I decided to teach at the community college level and not at the university level

Such excuses will only lead to failure as there is a tendency to start to pay more attention to the complaints than the material and very little studying gets accomplished. Avoid students who don't want to spend the allotted time studying. Again, this is a waste of your time. If you find yourself in just such a lousy study

group, get out early and try and get into a reliable group that will focus on the positives, progress forward, and let you optimize your study capabilities. If you must leave an ineffective study group, you shouldn't feel guilty. This is your education and your academic success which is on the line. They might be great people to party or talk with, but not so good at focusing on learning biology. We all love a good party, a great game and jabbering on about our lives, but for everything there is a time and place. If you set a time to study, then study. While your study group can be an enjoyable bunch of people to hang with, make sure that you get the study part done first and the party part done after. Work hard so that you can play hard. Remember that college is what you make of it. You paid to be here, you chose to take this course, you have the choice to get the best possible grade you can earn. As instructors and students ourselves, we recognize the difficulty of the material; however, we cannot do the work for you.

F. *DON'T TRY AND GUESS OR FIGURE OUT WHAT WILL BE ON AN EXAM*

No material is more important than any other material presented in this course. Plainly, as we progress through the semester - *you must study it all*. Any material presented during lecture or lab may be on an exam and if you try and guess what will be tested you will be greatly dissatisfied.

• **PUTTING ON YOUR BEST PERFORMANCE FOR EXAMS AND QUIZZES**

All of the information above will not do you any service if you do not perform well on the exams. Unfortunately, due to the structure of our educational system and the student to instructor ratio (there are too many of you, only one of me and only so many hours in the day), I cannot sit down with each of you and personally evaluate your level of knowledge of the subject matter on a one-on-one basis. Your grade will be based on your performance on each of the exams, quizzes and assignments. We all have good days and bad days and thus good exams days and bad exam days. In total, the exams are designed to give equal weight to objective and more thought provoking or short answer portions as well as to each subject topic. So, if you aren't particularly adept in one subject area or question type it won't destroy your grade. Thorough preparation and a diligent effort on your part will increase the likelihood of having a "good exam day".

1. *PREPARATION LEADS TO CONFIDENCE*

We all get nervous to some degree before and during exams and quizzes. The more prepared you are and the more you have studied and learned the material then the less anxious and nervous you will feel on exam days. *As previously described, practice tests and diagrams will help you develop confidence*. Study very diligently for the first exam, if you do poorly on the first exam then your confidence will be undermined from the start and you will feel like you are "catching up" the entire rest of the semester.

2. *GET A GOOD NIGHTS REST THE NIGHT BEFORE THE EXAM, EAT SOMETHING FOR BREAKFAST AND DO NOT DRINK TOO MUCH COFFEE!!*

Most students feel some sense of anxiousness or stress before and during an exam. Allow me to digress and tell you about the first exam I proctored as a teaching assistant in graduate school. During the first midterm for the course, about 40 minutes into a 50-minute exam, a student handed in his exam at the front of the lecture hall. As he did so, he proceeded to pass out backwards onto the floor. Not only did this cause an unnecessary commotion in the room and disrupt the exam, but I had to run to a nearby phone and call for the emergency medical service. Fortunately, the student awoke within a few minutes and he was found to be medically fit later. Apparently, the previous night he had gotten little sleep, stayed up nearly all night drinking gallons of coffee and had eaten nothing for breakfast. His blood sugar level dropped which together with the stress of the exam caused him to become unconscious. Please, I do not want a repeat of such a performance by any of my students in this class. Most students feel some physical or emotional strain during exams as the brain works to recall information and organize their thoughts during an exam. This requires the brain to use up a good deal of glucose (sugar) as fuel. You should have something to eat before the exam to keep your blood sugar level steady. By studying early, consistently, and effectively you will have the opportunity to generally review the material the night before the exam, go over your last few problem areas and get some sleep. By routinely studying you will be able to get up the morning of the exam, eat something, listen to whatever encouraging music you enjoy (some prefer Mozart, personally I am partial to SKA/PUNK), briefly review the material, and take the exam with confidence.

3. BRIEFLY LOOK OVER THE ENTIRE EXAM BEFORE YOU BEGIN

Be sure that you write your name on the exam and your scantron and make sure that you have all the exam pages and questions as stated on the first page of the exam. Look over the exam and answer the questions that are worth the most points and complete these questions first. Answer the questions that you are sure you know the answers to before answering the more difficult questions. By reviewing the exam you will be able to determine how to proceed according to your individual talents.

4. READ THE EXAM INSTRUCTIONS AND QUESTIONS CAREFULLY!

Many of the unfortunate mistakes that students make are due to the fact that they did not read the exam or quiz instructions or questions completely and carefully. Be sure that you read all of the instructions, the entire question, and all of the possible answers before selecting an answer or otherwise answering the question as instructed. Experienced test takers know that some answers are better than other answers. Just because a question type looks similar to a question type from a previous exam does not mean that it should be answered without reading the directions first. Experience also shows that if in doubt, go with your first instincts and your first answer, they are most often the best choice you could make. Don't waste time by "psyching yourself out" and trying to figure out if the correct answer is "this one or that one".

- WRITING THE BEST POSSIBLE LITERATURE SEARCH PAPER THAT YOU CAN
- (THIS ONLY APPLIES IF A PAPER ASSIGNMENT IS ASSIGNED IN THIS CLASS)

1. GET AN EARLY START ON THE RESEARCH

The earlier you start searching through journals and texts for a topic that you find of interest, the more time you will have to write the paper. Spend some time searching for a topic that interests you or has some relationship to your life (e.g. a disease which has afflicted a friend or family member or an environmental issue which you feel passionately about). Look at a variety of different journals to get a feel for the subject matter presented by each journal, the difficulty, and what you find personally appealing.

2. KEEP YOUR RESEARCH NOTES ORGANIZED

You should photocopy each of the articles you will need for each paper. Be sure that you copy or write down the author(s)' name, the journal title, the title of the article, and the volume, date and page numbers of the article. You will be required to cite these at the end of your paper. Once you find an article that interests you, you may want to look at other texts or other journal articles pertaining to the same topic to assist you in understanding the article you have chosen. Be sure to keep copies of the articles or texts from the library accessible and organized so that you can write your paper without having to scramble through your desk, car, closet, backpack, notebook, etc. (this is simply an unnecessary waste of your time).

NOTE: You will be required to submit copies of the articles which you referenced when you turn in your paper.

3. BE SURE TO INCLUDE ALL OF THE REQUIRED INFORMATION

As stated in the literature search assignments, be sure that you include all of the following in each of your papers:

1. Your name
2. A title for each of your papers
3. The name of the author(s) of the article
4. The name, date, volume number, and page numbers of each of the articles
5. A summary of the general nature of each article, What were the major points presented in the article? What questions were the scientists attempting to answer?
6. Your reaction to each article. What did you find interesting or new and why? Did you agree or disagree with the conclusions in the article and why? What new questions do you have now as a result of reading the article? Did the article have any affect on you at a personal level (lifestyle changes, fears, etc.)?
7. Pick one biological term or phrase from each article and thoroughly define it at the end of your paper in your own words. *Use your own words!!*

4. WRITE A ROUGH DRAFT FIRST AND THEN REWRITE IT LATER

Basically, if you write the paper carefully, review it and rewrite it, you will get a better score on the assignment than if you only write the paper once. My personal experience, as well as the experiences of many other writers both past and present, demonstrates this fact. Many students perform poorly on written assignments because they do not allot themselves enough time to write them. Generally, you will not do well on the papers if you write them feverishly and inaccurately, or if you do not read and rewrite your work before you turn in the paper. Get started early!

5. TAKE THE TIME TO REREAD YOUR PAPER MANY TIMES BEFORE IT IS DUE

To reiterate the above point, read over your paper many times before you turn in the assignment and correct any mistakes that you find. You wouldn't want to read a novel if it had meaningless sentences, spelling mistakes, or typos in it. It is a very good idea to have another student or friend read over your paper to catch any grammatical or spelling errors. A proofreader can also help you verify that your paper "flows well" and conveys your thoughts and ideas effectively. Think what the world would be like if Shakespeare, Salinger, or Stephen King blabbered on without reading over their work (and/or having their editor read it). You may not appreciate this now, but sometime in your life you will.

A note for those of you looking for a slightly more Renaissance education:

If you have not previously read the above authors then I would suggest that you read the following plays & books (of course, these are my opinions):

Much Ado About Nothing - a lovely and witty play about the relationship between the two sexes by William Shakespeare

The Catcher in the Rye - a coming of age story for any age by J.D. Salinger

The Stand - an extensive, character driven novel about the possible end of the world by Stephen King (much better than the Rob Lowe TV movie)

• THE WHOLE POINT OF ALL THIS ANYWAY!

I wish you all the best in this course and all your endeavors. I sincerely hope that you consider what you have read here. This course is neither difficult nor easy, but it can be challenging and will require you to work at it in order to succeed. In some ways, learning is like trying to lose weight. Some people will try and sell you quick fixes and easy ways out, but the only way to succeed is to keep track of what you take in and to constantly exercise your mind.

I welcome your suggestions on what you find useful and what seems to be a waste of your time as well as anything new or different that helps you learn biology.

Best wishes for a productive and thought provoking semester,
Blake