

A Guide For Studying Physical Science

Follow these steps for maximum benefits from this course (and a high grade):

1. Attend Lecture and Lab every day!!!!
2. Read the assigned text chapters and lab exercises BEFORE attending class.
3. Obtain a copy of the Instructor's class notes BEFORE attending class.
4. Pay attention during lecture, augment the instructor's class notes, make additional drawings of overheads and slides. Ask questions on terms and concepts you don't understand.
5. Do homework, exercises, and assignments on time. Put time and effort into your work outside of the class room. The lab, lecture, and assignments are coordinated so that students maximize contact time with the course material. Completing homework on schedule will help solidify the course material.
6. Study for the quizzes, they will help you prepare for the exams. You should set up a weekly schedule to study and memorize terms and concepts, even if you don't have a test that week! Repetition and review is the best method to avoid last minute (failed) attempts at "cramming".
7. Devise a weekly study routine focusing on key terms and concepts for the week. This will make studying for quizzes and exams easier.
8. Study Extensively for Quizzes and Exams.
 - A. Memorize definitions of key terms, formulas, and concepts.
(repetitive writing and verbal recitation is an excellent method for memorizing).
 - B. Make sure you understand key concepts.
 - C. Know all material listed on study guides.
 - D. Do extra work with text questions, and problems.
 - E. Skim back through the text to refresh yourself to the readings. Studying the figures and tables is an excellent way to review the text material.
 - F. Systematically relate the key terms and concepts to one another.
 - G. Be patient and study diligently for quizzes and exams.
 - you should spend a MINIMUM of 2-3 hours studying for a quiz.
 - you should spend a MINIMUM of 8-10 hours studying for a mid-term or final exam.
 - H. Ask the instructor to clarify concepts and terms that you don't understand, BEFORE you take the exam. Visit the doctor (of philosophy) regularly during office hours. Review quizzes.

STUDY TIPS FOR GENERAL SCIENCE COURSES AT WOU

(modified from Rosalie F. Maddocks, Professor of Geoscience, University of Houston)

THE IDEAL PLAN OF STUDY FOR HIGHLY SUCCESSFUL COLLEGE STUDENTS

These are things that successful students do. Use what works for you.

1. First, before the lecture on this topic, read the assigned text chapter(s) all the way through, without stopping and without making any marks in the book. The purpose of this first reading is to gain a general familiarity with the topics covered and the organization of the chapter.

2. Then, listen to the accompanying lecture, augment your lecture notes by hand. Try to integrate this information with what you read in the text.

3. Now read the text chapter a second time, more slowly. The purpose of this second reading is to achieve a thorough, complete understanding of the topics covered. This has to be done in chunks, one bite at a time, in sequence.

- Reading out loud, because it uses more parts of the brain (eyes, ears, tongue), can help you to concentrate and to remember better what you read.

- Each time you encounter a word you do not know, look it up in the Index or Glossary of the text or in an English dictionary. If geographic features are mentioned, look them up on maps in the textbook or in an atlas.

- Underlining (highlighting) is a substitute for learning, a promise rather than an accomplishment. It can be a procrastination device. Instead of underlining (promising yourself to study this later), stop right there in your reading and learn now what you have just read, right now. Of course, it is a good idea to mark lightly in pencil in the margin any statements you don't understand, to remind yourself to seek clarification.

- For complex material, it may be a good idea to make your own handwritten notes. Start by outlining the chapter, and then fill in more details. You will find this helps you to see the relationships between topics and the organizational plan of the chapter. Writing is a good way to etch the information into permanent memory. After you have made these notes, throw them away, or at least don't look at them again until you get to the Review phase. The value of the notes is in the doing of them.

- Analyze each illustration, reading the caption and relating it to the text, determining the significance of every line and label in that figure. Illustrations are as important as words in a science text. "Every picture tells a story." Try to explain in words the story that each picture is telling. Then push the book aside and try to sketch the idea yourself, in the same style as the figure. Practice drawing pictures of ideas -- it's called graphical reasoning, and scientists do a lot of it.

4. Now that you understand this material, learn it for permanent recall. Read the chapter for a third time.

- This time, after each paragraph or major section, push the book aside and explain to yourself (aloud or in writing if you wish) the main points of the passage you have just read. Your narrative should be in your own words but should use technical vocabulary and facts.

- The test of whether you understand a topic is whether you can recall and explain it. Teaching is an excellent way to learn -- try explaining these ideas to a friend or family member or study. Talk out loud!

- Study the accompanying lecture notes in a similar manner.

5. Find out whether you are ready for the exam.

-Scan the checklists at the end of the chapter. Can you define, identify, locate, explain, summarize or illustrate every one of the terms and concepts mentioned? If not, look up the ones you missed and study those parts of the text some more.

-Work the Sample Quizzes that may be provided. Check the answers and compute your score. Compare this score with the letter-grade scale for the course. Would you be content with this score?

-If you are not yet satisfied with your score, return to studying the chapter. Then try another quiz.

-Warning: It is a waste of time to attempt the practice quizzes before you have studied the chapter content.

-Warning: Don't try to memorize the answers to quiz questions. A quiz is not something to study. These "short cuts" don't work.

6. A day or two before the exam, review. Skim the chapter, the illustrations, the Lecture Notes and your other notes.

-Review means reminding yourself of what you have already learned, refreshing the memory traces of things you already know so you can find them quickly on the exam.

-Review does not mean learning for the first time. Review is not cramming. No one else can review for you -- only you can review.

LEARN TO READ!

Seriously, it is important to learn how to gather and retain knowledge from reading books and written materials. Reading for a science course is a different kind of reading than, for example, reading for a literature class or reading a novel or newspaper.

You will find that you need to:

Read slowly, for thorough comprehension.

Read completely (no skimming or skipping).

Read sequentially one sentence at a time, evaluating each sentence in its place as a necessary step in the logic of the paragraph.

Read selected passages multiple times, until you understand and can remember (for permanent recall) the information and the steps in the reasoning.

Read the entire chapter two or three or more times.

Have a good general English vocabulary, and use a dictionary as needed.

Integrate the analysis of figures and diagrams into your study of the related text passages.

Some students find that it helps to:

Outline the chapter, writing by hand. The brain learns things that are written more easily than things that are only read. Amplify the outline with each re-reading. But do not treat your outline as something to study. It is only a means to an end. The value of the outline is in the writing of it. Study the chapter,

not your notes.

Read the text out loud, slowly. This involves the parts of the brain that control speech and hearing. The more different parts of the brain you involve in studying, the better the information will be learned.

Break the hard words into syllables and practice pronouncing them correctly. (A dictionary can help with this.) You cannot learn a term (word) you cannot pronounce. Terms (words) are necessary handles (symbols) for concepts. Language (vocabulary) is an integral part of human reasoning. To understand a concept you must learn its "name" (word), and to learn the word you must be able to pronounce it.

Practice writing each new term (10 times on a sheet of scrap paper) until you can spell it correctly. Pronounce the word out loud each time you write it.

Read out loud in a lecturing tone of voice, and expand ad lib on what you are reading.

Read text materials into a tape recorder, and play the tape back and listen to it.

If you have trouble staying awake, stand up and walk around as you read out loud

After organizing the vocabulary and factual material, drill yourself until recall is accurate, consistent and automatic. Some students like to make flash cards.

TAKE RESPONSIBILITY FOR YOUR OWN LEARNING

You should be able to detect for yourself whether you understand a topic, whether you have learned what is necessary, and whether you have completed what needs to be done.

You should be aggressive in using the materials provided. You should be resourceful and timely in seeking assistance when needed.

For example, if there's something you don't understand, ask. Help is as close as an e-mail message to the instructor or to a classmate.

MAKE A PERSONAL STUDY SCHEDULE

It is possible that you will have to study more for this course than for some others you may have taken, especially if this is the first time you have taken a college-level science class.

The University expects that an average undergraduate student in an average class for an average grade will attend class 3 hours a week and study outside of class for 6 to 7 hours a week, every week. Everyone is different, so you will need to determine for yourself how much you need to study to achieve your objectives. A student for whom (for whatever reason) the material does not come easily may have to invest more time. **A student who wants a better than average grade may wish to invest more time.**

I find that most students underestimate both their academic potential and the study time they will need to achieve success. Don't settle for second-best. Please budget ample time to do yourself credit.

You should plan a personal study schedule for this class and stick to it. A worksheet is provided here to help you do this. I recommend studying for this course a little every day.

Small doses (an hour or two) repeated frequently are better than total immersion ("all-nighters"). Your brain needs the "down time" between study sessions to process the new information into long-term memory, so you can remember it on the exam. Much of this processing is done during sleep.

Cramming the night before an exam is not an effective way of learning. Stealing study time from one

course because you have an exam in another course works no better in academic life than it would in your financial budget.

Your study program should be part of a sensible personal time schedule for the semester.

That schedule should include realistic time allowances for working, commuting, family responsibilities, recreation, studying, and sleep.

Don't sign up for more classes than you can study for per term. Education is not a race, and there is no prize for speed.

Emergencies happen. Your personal schedule should include some flexibility to accommodate them.

You should be able to keep yourself on task and avoid procrastination. Take charge! Make your own reminders -- whatever works for you -- and stick to your schedule.

KNOW YOUR LEARNING STYLE

You are an adult, and it is expected that you know how to learn by many different methods.

Perhaps some ways are easier for you than others, but it is up to you now to figure this out and to make the appropriate adjustments. For example, if you learn best by listening, you can choose to enroll in a face-to-face section, or you can read the text into a tape recorder and play it back.

OTHER RESOURCES

Check out the tutoring program at the WOU Student Enrichment Program (SEP). If you request a tutor, SEP will find one for you and help you establish positive study habits.

Contact WOU Disabilities Services if you have learning disabilities that need additional maintenance.