

highlight) while reading the material the first time, chances are you'll take too many notes (or underline or highlight too much). Waiting until you've read the entire section and testing yourself helps identify the most important points, so your notes are more focused.

Homework Problems

The Usual Strategy: Students usually read the two, three or four sections assigned and then turn to the problems to be solved. The problems are solved with the book open -- referring to the appropriate section. This way, you could solve every homework problem correctly and still fail tests because you know what you're doing with the book in front of you but not necessarily learning the material well enough to remember it during a test without the book to help you.

Recommended Strategy: Homework problems are to test if you not only understand the assignment but also remember what you studied well enough to pass a test. Use the key strategy described above to study the assignment. Then, solve the problems with the book closed, referring back only occasionally, as needed. Use homework problems as a test -- solve the problems with your book closed. Sure, you'll need to refer back to it for some points - but just the ones you need to be refreshed on.

Lecture Notes

Put your text notes (notes on your assigned readings) on the left-hand page of your notebook (if you are right-handed). If you're left-handed do the opposite. Then, take your lecture notes on the right-hand page, opposite the appropriate section of notes from your reading. If the lecturer says only what's in the text, just star (*) it, meaning "This was discussed in class so it might be important. Know it!"

When preparing for tests, then, you'll have reading and lecture notes side-by-side for your study. Your lecture notes on additional material will be with the reading notes on the same topic.

Modifications

Any system will need modifications to fit particular student and instructor styles. Experiment until you find patterns that work best for you and the styles of each of your instructors.

For example, some instructors lecture from an outline, so taking orderly class notes is a breeze. For other profs, you might need to go over class notes after class and, using a red pencil, identify important points and sub-points.

If you have one of those classes in which tests are based primarily on lecture notes, your homework will be studying lecture notes using the key strategy described above. Apply it to the lecture notes and use the text just to fill topics discussed in class.

Reviewing for Tests

Your review for tests should be as much like the test situation as possible. Most tests require you to recall material from memory and to solve problems or write answers rapidly. So, your test preparation should give you practice in doing those things.

- Study each of the chapters and associated lecture notes.
- Study each chapter so you can set your notes and text aside and recite to yourself what you need to know. Essentially, you'll have the outline for that chapter (that appears in the table of contents) in your head.

Tests Requiring Rapid Solutions to Problems

First, learn the class material as described in "KEY STRATEGIES". Then, do some rapid problem solving without the book. Most problem courses require that you solve problems on tests much more rapidly than when doing homework. To prepare for this, try some rapid problem solving. Time yourself. Or, better yet, study with a student who is doing slightly better than you in the course. Each of you can copy a problem and then race to see who solves it first. Do this for at least 20 or 30 minutes for at least three nights before the test.

As an analogy, basketball players don't practice in slow motion all week long (we often do our homework problems that way, though) with play diagrams in front of them (we have our books in front of us). Rather, they simulate game conditions for part of their practice. Students can simulate test situations and come out winners!

Silly Mistakes

Do you make silly mistakes, such as $2 + 2 = 5$, or forget to carry signs? Most students do. One reason: homework problems are solved at a leisurely rate while tests require rapid problem solving. The best way to prepare for the test is to simulate it. Devise a system for practicing rapid problem solving as part of your review for the test. Another silly mistake is not taking time to read each test question thoroughly.

Objective Tests

Again, learn the material first using "KEY STRATEGIES". Then, simulate a test. Have a friend predict questions and ask you to answer them without referring to your notes. Trade places -- you ask the questions. Do this only after you've reviewed the material.

Essay Tests

Review the material first using "KEY STRATEGIES". Then, predict questions you think will be on the test. Use any clues the prof might have given, including sample tests if made available by the professor. Or, consider forming a study group with other students in your class and brainstorm themes/topics which you think may be most important. Then, outline your answers to the questions. Study these until you know them. You won't predict exactly what questions are on the test. But, chances are that you will predict most of the points/topics that are needed to answer the questions on the test.

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I Know the Material, but When I Test. . .

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Do you
study, and study, and study,
and are confident you
know the material . . .
but when you take the test
your mind goes blank? Well, you
are not alone. Learn some key
strategies to study more efficiently
and effectively to improve your
test scores.

I KNOW THE MATERIAL, BUT WHEN I TEST I GO BLANK!

INTRODUCTION

It is normal and healthy to feel some anxiety before an exam. Many students, however, complain about "test anxiety", explaining that they went into a test knowing the material but that they "went blank" when they began to take the exam. Or when they receive their test results, they find that they made "silly mistakes". What they think is "too much anxiety" may really point to a gap in their study skills.

Why? When most students prepare for a test, they read their notes or textbooks. As you read along, you may feel that you know (understand) what the author is saying. Understanding what you are reading at the moment does NOT mean that you know it well enough to remember it for a test when the book isn't there to help you. Thus, students may enter a test situation expecting themselves to "know" the material and finding themselves going "blank" when trying to answer a test item.

To be most efficient, each step of your study should be keyed to the test situation itself. So, you first need to prepare to deal with:

1. COMPONENTS OF THE TEST ENVIRONMENT
2. TEXTBOOK STRUCTURE.
3. KEY STRATEGIES FOR STUDYING

Once you fully understand these steps, which can help you be both better prepared and more confident when taking a test.

1. COMPONENTS OF THE TEST ENVIRONMENT

Nearly all tests include three things:

- No texts -- you will have to recall the information from memory. No notes. No clues. So, you have to make sure that you not only understand when reading the text but also remember the material from the first time you study it well enough to pass a test! This requires knowing how to use the text structure in studying and being able to solve problems WITHOUT looking back at the book! (see HOMEWORK PROBLEMS on back of brochure)
- Stress-- Taking tests adds stress. And, your performance tends to deteriorate under stress. So you need to learn the material well enough to remember it under stress.

- Time pressure -- you have studied several chapters and lectures, learned hundreds of facts, concepts, processes, solutions. You'll need to remember this rapidly in the test setting. This is especially important for those tests requiring rapid problem solving.

2. TEXTBOOK STRUCTURE

A good textbook is written and printed in a format that can be used to enhance your performance on the tests. USE IT TO HELP YOU STUDY!!!

Why would the structure of the textbook be useful?

- When beginning to write a text, the authors make a list of the 15 to 25 most important topics that need to be covered in the text. This list eventually becomes the titles of the chapters in the text. Next, the authors develop a list of 6 to 10 points to be covered in a chapter. Considerable time is spent in refining these, shifting some around, deleting others. These become the headings within each chapter, the chapter sections.
- This outline becomes the table of contents published in a text. If you were going to teach the course. You would know what's in the text just from looking at this outline. You would know that is what your students should learn, supplemented by the lectures you would prepare for them.
- You are taking the course to learn the material at least well enough to pass the tests. So, the authors fill in the outline for you -- they give explanations, history, examples, derivations, formulas or whatever is needed to educate you on each topic in the chapter.

Each chapter outline will be valuable in at least two ways:

- as a check to see how well you remember the chapter after studying it the first time, and
- as a way of remembering the material. You remember more details longer if they are organized. The chapter outline usually will provide an organization for text and lecture materials.

3. KEY STRATEGIES FOR STUDYING

Study a small piece of the assignment at a time -- study it well enough to pass a test immediately after studying it. We can hold about 7 or 8 bits of information in our heads at any one time. So we need to learn a piece with just a few concepts or ideas. A section usually is about the "right size" for our brains. So, study just one headed section at a time. Use the textbook structure to your advantage!

Question and study. Turn each section heading into a question and study to answer that question. Remember, the authors put all those words, problems, diagrams, etc. under that heading to tell you what they meant. DO NOT TAKE NOTES OR UNDERLINE OR HIGHLIGHT, YET.

Before proceeding further, test yourself before your instructor does. Stop at the end of that section, look away from the text, and test yourself. Make sure that you remember what you need to remember from that section to pass a test. If you're not sure, go back and check on the material and then test yourself again.

TESTING YOURSELF SECTION BY SECTION IS CRITICAL. If you can't pass a test on the material now, when are you going to learn it? You're gambling that you'll have time to go back and really learn it in the future. That often isn't the case as you'll have several tests coming along in other classes at the same time and limited study time. Also, you're gambling that you won't need to understand it for subsequent material in the chapter. Your goal is to learn and remember the material the first time through. Do not be content with just knowing what the authors are saying as you read the text -- you can understand it all but fail a test.

NOW TAKE YOUR NOTES, underline or highlight. Be brief -- just enough for you to recall what you have to remember from that section. Notes are preferable. Put them on the left-hand page of your notebook (if you're right-handed). Put lecture notes on the right-hand page opposite the appropriate reading notes. Repeat these steps for each section in the chapter: Turn the Heading into a Question

Study to Answer the Question

- Test yourself at the end of each section
- Review and test yourself on the entire chapter. On the weekend, go back and study your reading and lecture notes. Learn them well enough so that you can look at the chapter outline in the table of contents and remember what you need to remember for each section in the chapter.

See also SILLY MISTAKES, OBJECTIVE TESTS, and ESSAY TESTS below for more ideas.

That's the basic strategy. Minor modifications may be needed but overall it takes just these simple steps. Practice them until they become your way of studying.

SOME ADDITIONAL SUGGESTIONS

Testing yourself section by section is critical!

- 20% - that's what you'll remember two weeks after reading something if you just read it and set it aside.
- 50-65% - that's what you'll remember in two weeks if you test yourself right after reading.
- 75-80% - that's what you'll remember two weeks later after testing yourself two times.

Testing yourself after each section (Test 1) and at the end of the assignment or chapter (Test 2) puts you in the 75-80% category. When midterms come, you'll be reviewing just to get yourself from about 75% to nearly 100% rather than the usual practice of having to re-learn most of the material.

If you think that you don't have that much time.

There's no quicker study strategy than the key ones offered for learning and remembering knowledge well (unless you are one of the rare persons with a photographic memory). With this strategy, your initial study might take 20 to 30 percent longer than you are currently taking. However, when reviewing for major tests, you'll know the material better and will spend less time reviewing before tests.

Take Notes, Underline or Highlight?

Preferably take notes. Take your notes only after you have tested yourself at the end of each section -- step three above. When you take your notes (or underline or