Test Taking Strategies for STEM Students


Studies have shown that sleep quantity and sleep quality equal or outrank such popular campus concerns as alcohol and drug use in predicting student grades and a student’s chances of graduating.

Although in one survey 60 percent of students said they wanted information from their colleges on how to manage sleep problems, few institutions of higher learning do anything to counter the devastating effects of sleep deprivation on academic success and physical and emotional well-being. Some, in fact, do just the opposite, for example, providing 24-hour library hours that encourage students to pull all-nighters.

An all-nighter may help if all you have to do is memorize a list, but if you have to do something complex with the information, you’ll do worse by staying up all night, J. Roxanne Prichard, an expert on college sleep issues, told me. After being awake 16 hours in a row, brain function starts to decline, and after 20 hours awake, you perform as if legally drunk, she said.

Many college-bound kids start out with dreadful sleep habits that are likely to get worse once the rigorous demands of college courses and competing social and athletic activities kick in.

I’ve yet to meet a parent whose teenage child, especially if male, doesn’t sleep until 11 a.m. or later on weekends, throwing their circadian clock out of whack in a perpetual struggle to make up for a serious midweek sleep debt. It’s as if they travel across three or more time zones every weekend, then spend Monday through Friday recovering from performance-robbed jet lag.

In the process, they knock out of whack one in 20 genes governed by a circadian rhythm. The substances produced by those genes are not released at the right times and the body fails to perform at its best. Both cognitive and physical abilities are likely to suffer. In a study at Stanford University, when men’s varsity basketball players got an optimal amount of sleep, their free-throw and three-point field goal percentages increased significantly.

College students who fail to adopt more wholesome sleep habits are more likely to find themselves unable to handle their chosen course load and less likely to reach their academic potential, according to a national study of more than 55,000 college students.

The study, by Monica E. Hartmann and Dr. Prichard of the University of St. Thomas in St. Paul, Minn., found that for each additional day of sleep disturbance a college student experienced each week, the likelihood of dropping a course rose by 10 percent and grade point average fell by 0.02, even when most other factors known to influence academic success were taken into account.

“One in every three or four students nationally fails to graduate,” Dr. Prichard said in an interview. “If their sleep were improved, their likelihood of graduating would too. Nothing gets worse with better sleep, and a lot of things get better.”

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facts. In your STEM classes, you WILL need to show that you can connect ideas from related concepts, and cramming will not help you do this!

7. **Consider joining a study group.** The best learning happens when you are teaching a topic to another person! The best way to see if you have a topic down well is to try to teach it to your peers! This especially helps before exams when you are trying to put big concepts together to answer more open cumulative questions. Actually trying to explain the answers to a peer will help you make sure you have the vocabulary to give a good explanation!

8. **Space your exam study sessions.** About a week before your exam, review ALL of your notes that will go into that exam for 1-2 days. List topics that are still confusing or overwhelming to you. As you review your notes, also review quizzes that went over the material in your notes. Track ALL OF YOUR MISTAKES from those quizzes. Make sure you understand topics that were not clear to you on the quiz. Then take a day off from that class, study for other classes. Then 3-4 days before your exam, do that same exercise again. Go back through all notes and quizzes. Spend more focus on areas where you were not very clear from before. At this point, you should really be getting comfortable with the topics on the exam. You should focus on making connections between the different topics. At this session, you could time yourself with some new problems (ones you have not already done!). Give yourself 6 minutes for medium difficulty problems. This gives you practice under simulated pressure! Then take another day off. In the last day or two before exam, you can really focus on the areas where you are still trying to make connections and sense. This strategy works best if you have been reviewing your notes regularly as the weeks go along! Also, if this doesn’t work for you for your first exam (due to lack of time), try your best to implement this for exam 2 and beyond!

**Strategies for the night and morning before the exam.**

1. **Go to bed the night before your exam AT A REASONABLE HOUR!** Get at least 6 hours of sleep the night before the big event! As you saw at the reading before this, being sleep deprived cognitively is like being drunk, and you don’t want to take your first college science exam drunk do you?

2. **Distract yourself before you go to bed.** Just because you planned to get that 6 hours doesn’t mean you are setting yourself up for a night of uninterrupted sleep. If you study right up to the moment you go to bed, the wheels in your head will keep turning around and obsessing over minute details making you lose sleep. Instead indulge in reading a fun book or watching a brief comedy show before shutting off the lights to help you drift more easily into sleep.

3. **EAT BREAKFAST!** Your brain is a muscle, and it needs fuel to fully function! Make sure you have a good meal before you go in to take the exam.

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way, your professor will not credit you for understanding. Clearly show your understanding!

5. **If you don’t understand a question, ASK YOUR PROFESSOR!** The instructor should be willing to provide clarifications if their wording is unclear. Having said that, the professor may be not able to answer the clarification you are asking without giving the problem away, but it never hurts to ask if wording is confusing.

6. **SHOW ALL WORK WITH UNITS to get the most possible points.** Work as neatly as possible so you (and your instructor) can follow your work. Easy to follow work maximizes your potential partial credit. Also never erase a line of thought! Just put a line through it. If you had a correct line of reasoning that you crossed out for an incorrect one, many instructors will give you partial credit for the correct path if it is still shown. Also, if you realize that what you crossed out is correct, it is easy to circle that and write GRADE THIS!

7. **Do approachable problems first.** Don’t be afraid to skip around the test. Do things that look straightforward to you first. This will build your confidence.

8. **SKIP problems that are bogging you down.** If you are getting lost in a problem or it is taking too much of your time, start it, and come back to it. Don’t stay trapped in a tricky problem!

9. **Let the test teach you!** A later problem can correct your thinking about an earlier one or help you make an important conceptual link. Many times similar concepts are tested on the exam in multiple ways. Use that to your advantage!

10. **Manage mid test anxiety.** If during the exam you feel light headed or your vision is closing in, STOP. Place your pencil down. Close your eyes. Take a deep breath. Release it slowly. Repeat this and say to yourself you are going to beat this, not the other way around. Focus on a person you know will be proud of you when you persist in this course and reach your goals.

11. **Use your last 4 minutes wisely.** Instead of frantically flipping through the test and trying to tackle everything, use your last four minutes to FOCUS on ONE QUESTION and get all the possible points for it. You will likely get more points in the end than if you frantically fly around and try to make sense out of several things at once.

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