

## Study tips for BIO345 - Evolution

I asked high-achieving students from the Spring 2020 semester to share their study habits to help future BIO345 students. They overwhelmingly agreed on the importance of keeping up with the reading, attending office hours, have study groups and taking the practice exam well before the actual exam. Below I'm sharing some of the most note-worthy comments I received. The general conclusion you can draw from their responses is that not only did each one of them worked hard, they also had good learning strategies. I hope these will be useful for you too.

### **Top-ranking student of Spring2020:**

1. I go above and beyond on homework assignments. This is what causes most people to think I am a little crazy because they will look at a 10 point homework assignment of mine and see that I wrote 5 pages. When I work on homework assignments, no matter their point value, I explain and define every term (even ones I think I already know) so that they become more automatic. For instance, if the question is "what is this an example of?", my answer is never just one word and I explain my reasoning. That goes for practice multiple choice questions as well. The TAs probably thought I was insane because I always listed out my reasoning at the end of the multiple choice questions, but going above what is required well before the test means less "cramming" when test time comes around

2. Always ask questions when you don't know something and try to answer questions in class even if you aren't sure about your answer. This one took me a while to get better at because I have always suffered from anxiety, but luckily I was taught in elementary school about "exposure therapy". I was told to raise my hand at least once a day, no matter what. Eventually, I got better at it and felt less anxiety when I got an answer wrong and my body realized I was still alive.

3. When studying for the test and going through powerpoints, I read everything out loud and pretend that I am teaching someone the material. Sometimes I even ask my poor friends (even those who aren't in the class) if I can "talk at them" or teach them the material. I think this is a good technique because if I have trouble explaining it, I know that I don't really know it as well as I thought I did."

"A huge part was going to TA review sessions and asking about any concepts that I did not confidently understand."

"The habit that I developed that helped me the most was actively taking notes during lectures in a physical notebook. I started the class typing in word documents but I couldn't seem to remember everything that I had typed up. When I switched over to physical notes, the things I wrote down came to me quickly when I tried to recall the

information. Physically writing in my notebook during lectures helped me to also actively listen to what the professor was saying so that I could write what you were saying down.”

“Some of the study habits that really helped me was utilizing the programs provided early on in the semester [*Netlogo simulations*] to see the effects of genetic drift, natural selection, etc.”

“For information I struggled to grip I would refer to cog books or outside learning resources such as YouTube.”

“In order to test my understanding I would come up with questions that involve the topic that I may see on the test.”

“I would usually do the Cogbooks readings in advance, read them once and do the quizzes, and then go over them again to take notes (without the time pressure of the deadline).”

“Something I also did, but not for every exam, was write out notes while I was revising the powerpoints or handwritten notes on a whiteboard or separate paper in my nicest handwriting. I am not sure if the nice handwriting helps or not, but it helps me better focus on what I am writing.”

“Another piece of advice I would give is to take the practice exams after studying for it and without looking at the answers until you finished. This way the practice exam would essentially be an almost perfect simulation of the real exam. For me, taking the practice exams like this significantly reduced the stress and anxiety that I had leading up to the real exams”

“I also found study groups very helpful, as we collaborated on completing the study guide and answered each other's questions.”

“When I got an answer wrong in practice exam/class worksheet/recitation, I explained to myself why the answer I chose is wrong, and why other answer is right. It is a great opportunity to learn from mistakes.”

“I have learned that I am a better student when I prepare the day before class. That way, when I went to class I was focusing on the content that the professor was saying and had great questions to ask already. I learned these skills after struggling through certain classes. In the end, I have realized that if I put effort in, I see results.”

“I compiled the learning objectives from each lecture into one document and this forced me to go back through all the lecture slides, my notes, and the textbook to thoroughly fill out each bullet point. I would also include any diagrams or charts from the slides that applied to any of the concepts. Only after I had made this document and gone over it a

few times did I look at the practice exam - and I took it like a real exam without looking at notes so that I could identify what I still didn't know"

"Read the learning objectives before lecture to help you take more concise notes. Lots of graphs and models are shown in this course, if you take a few minutes to understand each one of them, the concepts that underlie the graphs and models will internalize and make more sense to you."

"What helped me prepare the most for exams was making concept-based mind maps and practicing solving problems. I would review my notes and the class presentations to extract the main concepts and their associated rules, theories, and definitions. I would write these in a 1-2 page mind map. Then, I'd do the practice exams and go back over the in-class questions to try and solve them on my own. After seeing what I got wrong, I'd review the concepts that applied to that question once again."

"Participation was a huge new addition for me. I have never participated as much as I have in this class, but I finally sucked it up and started raising my hand in front of the whole class. My biggest goal was to share/answer/ask my ideas and not overthink whether they were stupid or incorrect. If I was incorrect, the worst thing that would happen is that it would show other kids that it's not so bad being wrong as long as you keep trying. You honestly learn more that way."

"I truly think most of us are able to be successful just because we are having fun with learning. By understanding why I was learning the course material, I was able to leave the class feeling like a more knowledgeable and valuable person in this world."

"Instead of copying the words on the slides into my notes, I took notes on what the professor was saying about the slide. This includes the examples given, explanation of diagrams etc. The lecture slides are always available to look at after class so I thought it was more important for me to write down what was not going to be available to hear again. This also helped me be more attentive in class. I was listening to everything the lecturer said because I also needed to write it down."

"After correcting my practice exam and going through the questions again, I would go to the next available TA office hours. I found that often while explaining my reasoning for choosing certain answers, I realized I had understood other concepts, which I thought I knew, wrong. Plus, I would get to listen to other students' questions and try explaining the concepts to them."

"I believe the most important part was going to [*the professor's*] office hours and the TA office hours as well, all of them were amazing in discussing and debating the material.

“The things I found to help me the most throughout this semester were to take handwritten notes during lectures, then as I was studying to compile a document of important points on my computer.”

“I did a few practice questions on the days I didn't have class. I tried to make sure I did something to review the material almost every day (even if it was just a small thing) so everything stayed fresh in my head.”

“I studied with a friend for some exams which really helped us both. We could take turns asking questions and teaching each other.”

“I would go to the office hours held by the TAs before an exam. Here, I would ask any questions I had about things I hadn't understood when reviewing the in-class questions or the practice tests. These sessions were also extremely helpful because other students were typically there and I could hear about the things they were confused about, which would give me the opportunity to see if I was also unsure about this same topic or if it was something I could confidently explain to someone else.”

“While studying, I would take many “brain breaks” to allow myself to process the information”

“Take notes during lectures. Although I did not personally use my notes in my studying routine, taking notes during lectures helped me stay focused and engaged.”

“During the week or weekend leading up to a test, I would go through the lecture slides and make myself a practice test on google docs. Overall, I think making the practice tests is what helped me the most, especially when I would try to make more difficult questions (because you really need to know the material to make a difficult question).”

“Make sure no question goes unasked. You have opportunities through lecture, recitation, and office hours to ask questions.”

“I spent very little time reviewing the slides and instead I made sure I spent a lot of time going over the practice exams and lecture worksheets.”

“When going over the practice exam I made sure to understand why the correct answer was correct and why the wrong answers were wrong, looking at the wrong answers was especially helpful because it made me really try to understand the concepts better.”