

How to Succeed in 16B

The paths to success in 16B and 16A are very similar: if you understand lectures, discussions, and the notes, do the work in lab, and can do the homework successfully on your own, you will be in good standing to do well on the exams. This course is structured so that the HW feels harder than the exams and should not require extensively grinding practice exams. Ideally, a student who stays on track each week has to do nothing to prepare for an exam except making their cheat sheets.

At a high level, there are three pillars that are rooted in a foundation of making sure that you take care of your health, get enough sleep, and approach 16B material in a well-rested way.

- Solid background knowledge. This means understanding circuits on the level of 16A and linear algebra on the level of 16A and/or Math 54.
- Disciplined hard work that takes full advantage of the resources the course provides.
- Focus and complete attention for the time that it takes you. (Don't compare yourself to others. You are your own person. You'll take how long it takes you.)

The disciplined hard work is a lot more enjoyable if you do some of it in a group along with others. Although it is not required, we strongly recommend having a good study group that brings out the best in you all.

Many aspects of this course will test your understanding of the material. To help with this, we recommend actively reading and annotating the course notes, attending live lecture, attending and participating in discussion sections, and coming to HW party (or working in a study group). Labs will also help you develop a deeper understanding of the material, so we recommend working through each lab systematically.

Recommended Study Process

In a nutshell, our recommended process is:

- (A) Before lecture, skim the relevant course notes. This will help you get an idea of what will be covered in the upcoming lecture and help you connect the big ideas with the fine-grained details as they are covered in lecture. Having a general idea of the concepts can also help you keep up with the pace of lecture.
- (B) Attend lecture with no distractions and actively take notes. If you miss a live lecture, watch the recording with no distractions, while actively taking handwritten notes of your own. This is intended to help you better absorb the lecture's content.
- (C) Attend discussion and actively participate. If there has been a gap between lecture and discussion, take a few minutes to glance through your notes before discussion. If you miss a discussion, use the recording and the handout to do it yourself. Pause as needed. Avoid looking at the released solutions without trying to do the worksheet. If there are sections marked "practice" on the worksheet, try to do those — especially if you find yourself getting stuck on HW later.

- (D) Read the course notes in detail. We recommend that you actively read the notes as mentioned above. This means that you should annotate the notes as you read them and, in your own words, rewrite the parts that you find confusing. This will help you get a stronger understanding of the topics. Sometimes, the notes will cover topics in finer detail than the lecture. At the end of the day, the notes serve to not only reinforce your understanding of topics covered in lecture, discussion, and HW but also deepen it by introducing some more detail. In some cases, the notes also serve as a bridge between lecture and specific HW problems.
- (E) After the lectures and discussions, try to re-derive the material that was covered, before you start on the homework. This will help you both understand the big picture better as well as get practice in proofs and problem solving.
- (F) Start on the homework as early as possible. We recommend that you take some time for an initial pass to read over the problems (around 20 minutes per problem suffices). This should inform you about which problems you know how to solve and what topics you may have to review. Doing this well before the HW deadline gives you plenty of time throughout the week to review topics. Try to work with minimal distractions (we recommend printing the HW to help you with this). It is okay if you get stuck; in fact, it is even expected. After all, homework problems are designed to make you think quite deeply about new topics. Ultimately, the goal with this initial pass is to get started: read the problem carefully, figure out what questions are asking, write out what you know, and start setting things up. If you get stuck, write out why/where you are stuck and move on.
- (G) Meet with your group and/or attend HW Party to understand how to engage with the problems. If you're all stuck on something, ask for help by flagging down a member of course staff in HW party or posting on Piazza.
- (H) Take your notes and scratch paper from your group or HW Party and use them to write up your HW, in your own words. Again, a distraction-free environment is very important. If you get bogged down by any one HW problem, move on to another problem where you might be able to make progress. Also, set a total time limit per problem and stop working on that problem after that point.
- (I) When the solutions come out, read them and self-grade your homework. If there is a discrepancy, then read the relevant solution very carefully and take notes to make sure you understand. Try redoing the problems that you didn't get perfectly the first time, ideally without looking at your solutions notes. If you get stuck redoing the problem, then reread your notes and, if you are still stuck, reread the solutions more carefully. Once done, close everything and redo the problem on your own.
- (J) For labs, make sure you have done any problems on the HW that support labs.
- (K) Complete the pre-lab ahead of coming to your lab section.
- (L) In your lab section, work diligently with your lab partner, asking for help from your classmates and course staff as needed.

We believe that following the above process diligently should provide a solid foundation for success in this course. We encourage you to consider the above as a guideline which you can freely modify to suit your optimal study styles. For example, if you find that you learn much better from written material

than oral material, you might want to read the notes in greater detail before attending lecture and discussion. In many instances, the study strategies you develop through this process will carry over to other mathematical/modeling-based classes.

Additional Tips

In addition to the process outlined above, we hope that the following pointers can help you.

- 1 **Try to utilize HW party.** HW Party is great if you don't have a study group, everyone is welcome there. You can also ask people there to meet up afterward to continue working on the HW. You're not alone. You are welcome, even if all you want is to be in the company of your classmates. Prior to attending a HW party, we encourage you to try your hand at the problems — you will get more out of the HW party this way.
- 2 **Try to join a study group.** While it is certainly important to attempt HWs on your own, it can be very beneficial to join a study group no matter how large. We strongly recommend students to fill out the study group formation form and get an official study group. When someone asks a question and someone else answers it, the person who is answering the question is actually getting the better end of that win/win deal! So don't feel guilty about sincerely talking to someone about the homework — you're not hindering them.
- 3 **Print out your HW.** We understand that this may sound like a waste of paper; however, we want you to be able to use your visual field and spatial memory while minimizing distractions. For an especially involved problem, writing your solution on paper allows you to more easily keep track of the big ideas as you progress. Additionally, with the million possibilities that accompany an open laptop, it is quite easy to get distracted. We recommend trying the printers in Cory/Soda or the Open Computing Facility (OCF). You also may be able to get paper copies of the homework and notes from our in-person homework parties!
- 4 **Attempt the warm up practice problems at <https://eecs16b.org/hw-practice/>.** It might seem counterintuitive to think that if HW is taking you too much time that you might want to do more problems. However, sometimes more is less. The online practice problems are designed to help you get started, along with the notes and the problems in discussion. These generally serve as a stepping stone to reinforce your understanding and help you complete the HW.
- 5 **Maintain a summary booklet of the big ideas and theorems.** You may think of this as a cheat sheet with more details (and more pages). As you learn new topics in the course, you may find it helpful to think over the big ideas covered in lecture and corresponding theorems. You may also find it helpful to write some worked examples to give you an idea of how the theory connects with practice.
- 6 **Ask and answer questions on Piazza.** This has a very similar effect to joining a study group with other students. We understand that it is not always possible to interact with your study group, in which case interacting on Piazza would be a viable method to achieve similar outcomes.
- 7 **Try "rubber ducky debugging" to help strengthen your concepts.** Rubber ducky debugging is the process of explaining a concept to an inanimate object. The act of explaining a concept can shine a light on the gaps in your own understanding. You can also write out your thoughts to keep track of them more easily. This process can also be applied to HW and discussion problems.

Conclusion

We hope this advice helps. You are an individual. Don't judge yourself based on how long things take you. What matters is understanding the material. In today's times, we will add the modifier: please keep things in perspective. 16B is great and all, but there are plenty of things that matter more than understanding this material or your grades. Yes, we want you to work hard and grow. But we don't want you to break. Be safe. Take care of yourself. Take each day as it comes. We want you to succeed as a whole person.

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