

The Secrets of College Success

SECOND EDITION

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 Professors' Guide 
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10 Best Tips for Engineering School

As engineering enrollment has steadily increased over the past 20 years, more and more students are realizing that engineers are creative problem-solvers who help to shape the future. Indeed, more than one-third of college students today are enrolled in either an engineering or a science program. Before you embark on your journey of discovery, design, and innovation, it'd be good to know how to prepare yourself for the trip. So we asked Bruce Mendelsohn, director of communications and outreach at the Bernard M. Gordon Engineering Leadership Program at MIT, to hit up some of his colleagues and friends—not to mention himself—for key advice on how to succeed at engineering school. Here are their ten best ideas:

- 1. Find an engineering discipline that motivates you intrinsically.** Whether you opt for chemical, civil, mechanical, industrial, biological, or biochemical engineering, choose an engineering discipline in which you are genuinely interested. Your major most likely represents your career path, so by all means, be pragmatic—but also remember to follow your heart.



EXTRA POINTER. As you make your way through the intro courses in the various fields of engineering, pay attention not just to the grades you get but also to how much you enjoy (or don't enjoy) working in each field.

- 2. Understand the first principles and never simply memorize.** Concentrate on internalizing the first principles of engineering: the basic concepts that lie beyond the problems you're trying to solve. Challenge yourself to describe engineering concepts effectively in layman's terms to your nontechnical friends—after all, you'll have to do so when you

get into industry. A neat party (or bar) trick for engineers is distilling complex concepts into cocktail napkin-sized diagrams and explaining them to nonengineers. (Really. It works.)

- 3. Intern with different engineering companies and in different industries.** A three-month summer internship helps you convert classroom knowledge into engineering know-how and gain real-world engineering experience. Try different industries and corporate cultures to see which one works best for you.



5-STAR TIP. Ask around to see what programs are available and the companies where your department has successfully placed students in previous years. Also, if your department has bulletin boards—either physical or on the departmental web page—check them out too. And if you (or your parents) have a friend in the community who's working in some engineering discipline, reach out to him or her. Leverage any contact or relationship that you can.

- 4. Network, network, network.** Start making contacts while you're in school as an undergrad and continue to do so after you graduate. The professional network you build during your time as an undergraduate (through your internships, externships, co-ops, professors, advisers, and so on) will complement your paper diploma. Whether online or at career fairs offered by your school, aggressively seek networking opportunities.



ON THE WEB. LinkedIn—not Facebook. Facebook is for fun; LinkedIn is for professional purposes. Also, check out your school's career services website and ingratiate yourself with the people who work in that office—good relationships are key, both on- and offline.

- 5. Diminish your digital distractions.** Most engineering students think they're prolific digital multitaskers, capable of answering

the phone, reading, sending texts or email, and listening to music all while doing problem sets. But most aren't as good at it as they think. According to Stanford University research, these activities can negatively impact your ability to retain and accurately recall information. When it's crunch time, study in a quiet environment without digital distractions. And never cram. According to a recent UCLA study, sacrificing sleep for extra study time—whether it's cramming for a test or plowing through a pile of problem sets—is actually counterproductive. Ample sleep is critical for academic success—especially for aspiring engineers.

6. **Be single-minded.** Every engineering school has a required curriculum of introductions to the various areas of engineering: concentrate on doing well in all of them, not just the one(s) you most like. Also, rather than double major—as many go-getting engineering students seek to do—choose one major and pack in as many relevant courses as you can.
7. **Take leadership classes.** It's not enough for tomorrow's engineers to be technically proficient: you must also learn how to lead teams of people with diverse skills, from different cultures and socioeconomic backgrounds. As engineering teams transcend national boundaries and time zones, devote yourself to developing the engineering leadership skills that will help you lead a multinational project or an international team.



BEST-KEPT SECRET If you know what you're planning to go into after you graduate, and if it essentially involves work in other areas of the world, it's not a bad idea to build up a competence in the relevant language. If you plan, for example to do transportation engineering in Saudi Arabia, you could benefit from knowing some basic Arabic. And don't forget to brush up on the technical terms needed for your field of interest. Lots of people worldwide know some English, but in certain cases you could get a leg up if you can communicate with your coworkers.

8. **Take courses in majors that complement your primary study.** Knowing more about adjacent systems will help you see the big picture of the design and understand the constraints (or areas of flexibility) that characterize the overall product. For example, if you're an electrical engineer, think about the mechanical packaging requirements of your components, the heat transfer challenges of a design, the interference on sensitive communications or audio circuits.
9. **Take writing classes.** You may have thought that engineering was all numbers and calculations, but when I ask recruiters what attribute they most look for in a new hire, their resounding answer is "writing skills—we have to write about everything we do—we take the engineering knowledge for granted." Rather than avoiding English and communications classes when fulfilling your arts and humanities requirements, challenge yourself to become the effective communicator that employers seek. If you can't communicate in writing, your education can come up short.
10. **Ask, ask, ask.** Although engineers are naturally curious about the topics they're working on, sometimes they're not as curious about other areas. Be actively curious about people not like yourself and about topics unrelated to engineering. Take classes in topics you know nothing about. Challenge assumptions. As an engineering student, you may find it easy to fall in love with technology; however, engineering is about relationships—specifically, between technology and society. Get an engineering *education*, not just a degree.