IS ENGINEERING HARD?

QUESTIONNAIRE
So you’re thinking about engineering, eh?

Well, I have some good news for you:

Getting an engineering degree and pursuing a career as an engineer is difficult, does require hard work, and can be a hellish struggle sometimes involving banging your head against the wall for 3 hours on one homework problem only to realize it wasn’t actually assigned.

But that’s not all it is.

It can also be an exciting challenge filled with engaging and meaningful work, great pay, and virtually unlimited career potential. A truly worthwhile pursuit.

What you really want to know is:

- Is it worth the effort?
- Am I cut out for this degree program? This career?
- Can I actually get in?
- Am I smart enough, hard-working enough, prepared enough?
- Will it all pay off in the end? Or will I end up with just another crappy “create this spreadsheet, redo this powerpoint” entry-level job like everybody else?

My answer is of course: it depends.

But below you’ll find a set of questions to ask yourself in order to determine how hard engineering will be for you, given your abilities, motivations, and mindset.

Go through and answer these as truthfully as you can, and you’ll walk away with a good sense of whether engineering is worth the squeeze for you.
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Factor #1: Motivation, Purpose, and Determination

If you’re already thinking about engineering you’ve self-selected yourself into a group of people who are generally capable (from a learning and IQ perspective) of achieving what’s necessary to pass the classes and get the degree. But among this group, it seems that motivation and determination are what separate the wheat from the chaff.

A lack of (or misplacement of) motivation and purpose will significantly hinder your chances of success pursuing a career in engineering.

(1) Is engineering just something you fell into because you seemed to have an aptitude for math and science?

Considerations:
- Just because you’re good at something, doesn’t necessarily mean you have an interest in it (although it’s a good start).
- Going with the flow can work out, but it can also lead you into a situation you didn’t want to be in (a.k.a. an extremely difficult degree program).

(2) Are you pursuing engineering because your parents want you to (or at least you think they do)?

Considerations:
- Sometimes this works out and their encouragement, along with some mild threat of shame and disownment, is enough to push you through.
- More times than not, this doesn’t work out. You may finish your degree, but it’s an uphill battle the whole way and you end up hating it. You may never make it into a career as an engineer because you’re so burnt out.
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(3) Are you interested in engineering because it’s practical, and you want to make money when you graduate?

Considerations:

- An engineering degree will grant you more career earning power (on average) than most other bachelor’s degrees. This is awesome.
- How much money do you actually need to live the life you want?
- If this is the only reason you’re doing the degree, you’re setting yourself up for disappointment. If money is the sole focus, there are other things you could be doing with a larger upside. And money alone is not enough to keep you going when the going gets tough during the semester.

(4) Are you pursuing engineering because you have a genuine interest in the idea of being an engineer and solving problems?

Considerations:

- You don’t have to be “passionate.” It’s a mistake to think you need to have a golden path laid out in front of you. You do need interest though. Passion comes later once you develop skill and experience.
- If you have a curiosity for solving problems, tinkering, and pursuing your intellectual interests, motivation won’t be hard to come by. Combine that with some hard work and commitment and you’re in good shape.
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Factor #2: What ya comin in with?

Believe it or not, your talents, your experience in life and school, and your attitude will play a major part in how difficult you will find pursuing a degree and career in engineering. Imagine that…

Now, this is NOT me saying those things cannot at least to some degree be developed through focused practice and dedication once you do start college. Because that can happen. I’ve seen it happen. But it will make it more of a challenge if you don’t have these attributes coming in.

(1) How well did you do in math and physics in high school?

Considerations:

• If you’re well versed in trig, calculus, and physics, you’ll generally find engineering courses much easier to handle because you have the fundamentals down and don’t have to learn them in addition to the new concepts you’re covering.
• If you’ve taken the AP exams in either calc or physics and scored well enough to earn college credit, you can get ahead in your degree program, which will make it more manageable especially in those first two years.

(2) Do you have experience with “hands-on” work or projects?

Considerations:

• This could be Legos, video games, computers, cars, woodworking, etc.
• If you have started to develop your “problem solving muscle” ahead of time you’ll have a much easier time when you hit engineering school.
(3) Do you know how to study and take exams?

Considerations:

- It’s easy to skate through high school on natural ability and never really learn how to study. If you haven’t it’s going to take you significantly longer to complete homework assignments, projects, and study for exams than someone who has those skills already developed.
- If you get test anxiety, it’s going to make your courses more difficult because the large majority of your grade is determined by just a few exams, and you’ll have to spend more time preparing to feel comfortable.

(4) Can you manage your time?

Considerations:

- If you already keep a schedule, write everything down in a todo list, and plan at least a week or two ahead, you’re in great shape.
- If you mostly fly by the seat of your pants and do everything last minute, you’re in for a rude awakening, because the workload gets intense, especially during exams and at the end of the semester when all of the final project reports stack up.
Factor #3: Can you deal?

In some ways, everything we just talked about don’t seem to matter all that much unless you’re also a bit of an “unreasonable” person. The type of person where when the going gets tough, you bear down, grit your teeth and push through. No amount of skill or motivation will keep you going. It’s something else. And if you don’t have it, you’ll find engineering a hell of a lot more difficult.

(1) Can you handle adversity and push through?

Considerations:

• The ability to set goals and stick to them is critical when you’re pursuing anything difficult, let alone trying to become an engineer. You’re ability to stubbornly push through will help you significantly as you progress through your degree program.
• If, on the other hand, you lack focus and find it hard to bear down and work hard at something for an extended period of time without an immediate reward, things may get real sketchy. Because you can’t exactly “take a break” once the semester starts rolling.

(2) How do you view your abilities and your failures?

Considerations:

• If you have a fixed mindset (and believe that your current skills are what you’ve got and that any mistake you make is a reflection of how much you suck) you’re going to be continually set back and demoralized in engineering school. Not exactly a recipe for success.
• If instead you view each failure as an opportunity to improve and assume that you can improve if you work at it, you’ll be in much better shape.
(3) Can you take ownership, even if it’s not technically your fault?

Considerations:

- You’re going to have to work with other people when you pursue your degree, and even more so when you eventually enter the workforce. If there’s a project due that has your name on it, are you willing to do more than your share to make sure it succeeds? (Hint: if you said “yes” you’ll find everything much less stressful)
- Even if someone doesn’t pull their weight, or you get unlucky with a bad professor, or your textbook order gets lost in the mail… whatever it is, if your inclination is to complain about how unfair it is, rather than stepping up and fixing it, you’re going to struggle.
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The Engineering Difficulty Equation

How hard will it be exactly? Well lucky you, I came up with a thoroughly researched, highly accurate, ad hoc equation right now in the last 15 minutes you can use to determine how hard you'll find engineering.

\[
\frac{\text{Already Difficult Baseline}}{\text{(Motivation + Skills + Attitude)}} = \text{Engineering Difficulty}
\]

Here’s how it works:

Engineering is already difficult, no matter how prepared you are. So I’ve given it a 90 out of 100. Makes sense to me… so we’re goin with it.

Then, rate yourself on a 0 to 10 scale in terms of your Motivation, Skills, and Attitude along the lines we discussed above. And plug it all in.

So the perfect, impeccably prepared, highly motivated engineering degree candidate would end up with an Engineering Difficulty of 3.0. Never a 100% guarantee, but pretty much a complete slam dunk.

<table>
<thead>
<tr>
<th>Already Difficult Baseline</th>
<th>90</th>
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<tr>
<td>Motivation</td>
<td>10</td>
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<tr>
<td>Skills</td>
<td>10</td>
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<tr>
<td>Attitude</td>
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<td><strong>Engineering Difficulty</strong></td>
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On the other hand, someone who has no motivation, no previous exposure to calculus and physics and study skills, and a horrible “woe is me” attitude…
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<th>Already Difficult Baseline</th>
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<td>Motivation</td>
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<td>Attitude</td>
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So, run this little super-scientific calculation for yourself. You’ll have an idea of where you stand on the Engineering Difficulty scale, and how hard you’ll find the degree if you do decide to enroll.

3.0 = A competitive marathon runner doing a charity 5k.
5.0 = An optimal challenge. Difficult but reasonable.
7.0 = Getting into “slog” territory. But it’s doable.
9.0 = There’s a good chance you’re going to drop out.
15.0 = Please don’t waste your time. Get your act together first.
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What now?

Have questions?

Feedback?

Want more answers?

Slapping yourself because you never knew how simple it could be?

Send me a note at tom@phyzzle.com.


And if you’ve found this guide useful… please, share it far and wide, and help fight back against the needless agony experienced by college students everywhere.