

Welcome to MIT Lincoln Laboratory's Introduction to Engineering.

In this course, we will explore how engineering can be an excellent foundation for a wide array of technical and scientific careers using real-world examples from MIT Lincoln Laboratory projects.

These examples are only the beginning, though, because engineering is for everyone.

Engineering is a process that you can use to solve problems that matter to you and to your friends, family, and community.

But first, what is engineering?

Engineering is defined as, one, "The branch of science and technology concerned with the design, building, and use of engines machines and structures." Two, "The work done by or the occupation of an engineer." And three, "The action of working artfully to bring something about." This third definition is our favorite because it indicates that engineering is not only a career path, but it also involves using creativity to improve existing technologies and build entirely new technologies that don't even exist yet.

Engineering is a way of thinking.

Engineering is the art of intentional problem solving and using mathematical and scientific principles to produce an optimized solution.

You've probably learned about the scientific method in your science classes.

It probably went something like this.

Start by defining the problem so you have a good picture of what is needed.

Then identify your resources so you know what you have available.

Some of the most interesting projects come out of creative reuse of everyday items and technology.

Now, research existing solutions to see if someone has already come up with a solution to this problem.

If the solutions you find don't work for your situation or need to be improved, then develop an approach of your own and come up with an experimental plan to put it into practice.

Once you've developed your prototype, make sure to take detailed notes.

This helps when others want to use your prototype and when you return to it after time has passed.

You can always continue to improve your own prototypes as you learn more by trying it out.

This is very common in the research world, too.

This kind of problem solving is the basis of all engineering and science.

What makes engineering different from science is that you also get to build stuff.

Engineers use science, mathematics, materials, and ingenuity to build everything from tiny structures that can travel through the bloodstream to evaluate the health of a patient to huge machines that can take an astronaut to Mars.

Your imagination is the limit.

Well, and your budget for the project. You don't have to master every mathematical and scientific concept to be an engineer.

That's what teams are for.

Most engineering projects involve people with different skill sets who, together, through creativity and hard work, can determine the best solution or solutions for a particular problem.

Depending on what type of engineer you want to be, you will gain additional skills that focus on your specialty.

But the core engineering skill set will set you up for success regardless of what type of engineer you decide to be.

So how do you decide what type of engineer to be?

MIT Lincoln Laboratory office of this course will help narrow down the possibilities.

How can you apply the engineering process to solve problems in your life?

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