

ENGR 110 Final Tutorial 2023

Remember the ethics tutorial below from early in ENGR 101? We will repeat this tutorial - exactly the same questions - to see how your views have changed. A few notes:

- (1) Ideally you can work on the same question you worked on in ENGR101, but again that's not essential.**
- (2) Paper copies will be provided. You can take a photo of your written notes and upload. Or you can work directly on your laptop.**
- (3) Be sure names of everyone in your group are on your submission but you should submit your own notes this time.**
- (4) Please comment on how your understanding of engineering ethics has developed over this year.**

ENGR 101 Tutorial 1

Please think about these questions in advance. We will divide into groups interested in working on the same question, and toward the end each group can give a two minute or so summary of their thoughts. If you can pick your question in advance that would be great.

It would be difficult to deny that computers have made our lives much better overall. They have reduced mental drudgery, increased standards of living, improved safety The positives would make a long list. But as with any enormously powerful tool, there are also great dangers. We want to consider some of those today, and think about the resulting ethical issues for engineers.

- 1) During the cold war, many scientists and engineers worked on the development of nuclear weapons and the means to deliver them, but others refused to work on these projects. Nuclear weapons were and still are so horrible (some individual weapons were equivalent to hundreds of Hiroshima bombs) that many people thought they were unusable even at the height of the cold war. This was summed in the term "MAD" or "Mutually Assured Destruction," the idea that these weapons could not be used because the destruction of both sides was assured. Fortunately this was never tested, but we came pretty close on a few occasions. Today our entire civilization is controlled by computers (electric supply, sewers, traffic lights, water, banking). Some people think that the destructiveness of an all-out cyber war could approach that of a nuclear exchange. This might be exaggerated but at a minimum the consequences would be devastating, and it is proving very difficult to prevent the spread of cyber weapons to terrorist groups and rogue countries. The US claims to have solid evidence that hacking groups linked to Russia worked their way into computers of political groups and voting systems and attempted to interfere with the 2016 elections, and other western democracies claim similar attempts by Russia to interfere in their elections. Under what circumstances is it ethical for an NZ engineer to work on cyber weapons for the NZ government? How about for a friendly foreign government? How about a contractor working for one of these governments?
- 2) Companies are often under huge pressure to get software to the market in a hurry, and sometimes that may mean taking shortcuts with security. There have been demonstrations of hacking everything from webcams in houses to cars to appliances to toys, and of course computers. This can have quite devastating effect on the victims. What are the obligations of

software and hardware engineers in this matter? If you are aware that the product your company is about to deliver is not secure, what should you do? That would likely depend on the kind of product involved, but try to develop some guidelines.

- 3) We now live in a “surveillance society.” We are on camera pretty much any time we are not in our houses and perhaps even there sometimes, our phones track us, and our internet use is stored and scrutinized to an extreme. This has led to a loss of privacy for individuals that would have been impossible to imagine a generation ago. Ask a tutor to show you an *extreme* example of this. Extensive surveillance makes political dissent dangerous in many countries around the world. Under what circumstances if any is it ethical to work on data mining tools and other software that invades privacy?

Please submit a one short paragraph or bullet point summary of your ideas.

Homework (not to be submitted but strongly recommended).

Read

<https://www.ipenz.nz/home/professional-standards/ethical-conduct>

My understanding of engineering ethics has only increased monumentally over the time since I last did ENGR101. I now have a strong ethical compass and while I have changed a bit. (I would be willing to build weapons of mass destruction for NZ and friendly governments), I would still not be willing at all to build a cyberweapon for anyone other than those/the bad guys. Now a contractor who's working for a NZ/friendly Government, I would also happily design and produce a weapon of mass destruction for those two parties as long as they were friendly to the government. If in a certain scenario our friendly prime minister was taken over and influenced by an evil government and asked me to produce a weapon of mass destruction, I'd have to say no and run away into hiding.

My understanding of engineering ethics has increase monumentally over the time I last did ENGR101, I have a strong ethical compass and while it's changed a small amount since last time. I would build weapons but it'd depend upon who for and what the purpose of them would be. I wouldn't be willing to create and produce them for everyone and everything, they'd have to be a safe and secure client for my weapon.

NZ Government:

When it comes to if I would build weapons of mass destruction for the NZ Government at the end of the day I would happily design and produce one for them. As long as they aligned what I believed in and were not being puppeted by an Evil Government from another country I'd do it.

Friendly foreign Government:

When it comes to if I would build weapons of mass destruction for Friendly Foreign Governments I would also love to make and produce weapons of mass destruction for them. As long as they aren't influencing my NZ government at all.

I would also do the same for a contractor ^^^ as long as they're open about what they're doing and are working for a friendly government.