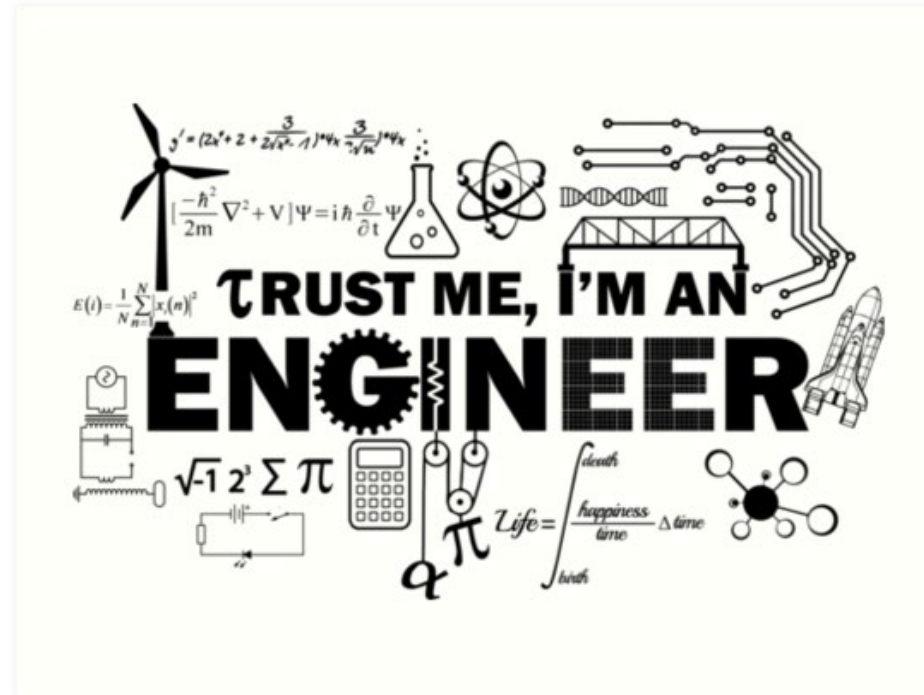# *Lecture 5: Professional Engineer Code of Ethics*

Our Civilization is Highly Dependent on Engineering

The "How Many Engineers Does It Take to Change a Light Bulb" Matrix

How many electrical engineers does it take to change a light bulb?
None: The bulb is fine. You need a new filament.

How many civil engineers does it take to change a light bulb?
Six: One to do it and five to do the environmental impact study.

How many mechanical engineers does it take to change a light bulb?
Seven: One to decide which way the bulb should turn, one to calculate the force required, one to design a tool to turn the bulb, one to design a comfortable - but functional - hand grip, one to test it, one to define the new safety standards, and one to use all the new equipment.

How many chemical engineers does it take to change a light bulb?
Two: One to define the process and one to hire the Electrical Engineer to actually do it.

How many aerospace engineers does it take to change a light bulb?
I have the answer but I can't tell you. You do not have the clearance to access that information.

How many software engineers does it take to change a light bulb?
```
int changebulb(numberofchangers)
{
  numberofchangers=0;
    do testbulb(status);
    {numberofchangers =
        numberofchangers+1; }
    while (status=bad);
}
```

How many genetic engineers does it take to change a light bulb?
None: We have altered our DNA to provide night vision.

How many industrial engineers does it take to change a light bulb?
Currently it is "1", but we think we can get it down to "0.76" by Q2.

NUS National University of Singapore

There is a general view that engineers are people who are really good with math and physics and are highly trained specialist such that, just because you are an "engineer", they think you can solve any engineering problem… . *a compliment of sorts*… ☺

Engineering, is a respected profession, and with this privileged position, we need to be dedicated to, the protection of the public health, safety & welfare.

Engineers must perform under a standard of professional behavior of the highest principles of ethical conduct.

But what is a Profession or who is a Professional?

"A **professional** is a member of a profession or any person who earns their living from a specified professional activity. The term also describes the standards of **education** and training that prepare members of the profession with the **particular knowledge and skills** necessary to perform their specific role within that profession. In addition, most professionals are **subject to strict codes** of conduct, enshrining rigorous ethical and moral obligations.

Professional standards of practice and ethics for a particular field are typically agreed upon and maintained through widely recognized **professional associations**, such as the NSPE Some definitions of "professional" limit this term to those professions that serve some important aspect of public interest and the general good of society."

https://en.wikipedia.org/wiki/Professional

1 2 3 4 5 5 6 7 8 9 10 11 12

Which of these do you say are professionals?

What is a Professional Association?

❑ A professional association (also called a professional body, professional organization, or professional society) is usually a <u>non-profit</u> organization seeking to <u>further a particular profession</u>, the <u>interests</u> of <u>individuals</u> engaged in that profession and the <u>public interest</u>.

❑ The roles of these professional associations have been defined as:

- "A group of people in a <u>learned occupation</u> who are entrusted with maintaining control or <u>oversight of the legitimate practice of the occupation</u>;"

- "A body acting "to <u>safeguard the public interest</u>;"

- "An organizations which "<u>represent the interest of the professional</u> practitioners," and so "act to maintain their own privileged and powerful position as a controlling body."

There are really very many….

What about a Professional __Engineering__ Society?

An engineering society is a professional organization for engineers of various disciplines. Some are umbrella type organizations which accept many different disciplines, while others are discipline-specific. Each has a strict **code of ethics or conduct** impose on their members.

Many award professional designations, such as European Engineer (Eur-Ing), Professional Engineer (PEng, P.E.), Chartered Engineer (CEng), Incorporated Engineer (IEng) or similar.

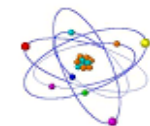https://en.wikipedia.org/wiki/List_of_engineering_societies

We will focus on the following…

https://www.nspe.org/

https://www.ies.org.sg/Home

Optional

https://www.peb.gov.sg/index.aspx
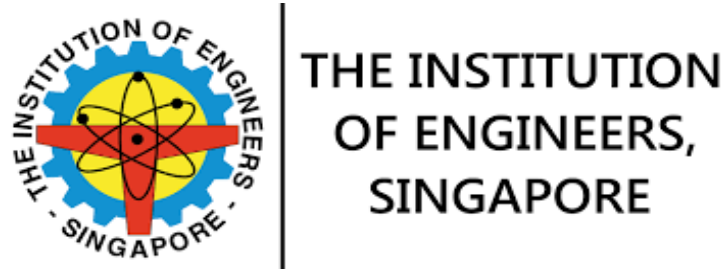
Engineers' Creed and Code of Ethics (NSPE)

We will look at the Code of Ethics for Engineers (NSPE) in detail

1. **History of NSPE and Principle of Codes**

2. **Engineers' Creed (NSPE)**

> "*In civilized life, law floats in a sea of ethics.*"
> Former US Supreme Court Chief Justice Earl Warren

3. **Code of Ethics for Engineers (NSPE)**

    Preamble

   i. Fundamental Canons

  ii. Rules of Practice

 iii. Professional Obligations

Compare: Rules of Professional Conduct IES (Institute of Engineers, SG)

For further study: Code of Professional Conduct and Ethics of PE Board (S)