Scientists Versus Engineers

**Engineer**

Applies knowledge of math and the physical sciences to the efficient *design* and *construction* of usable *devices*, *structures* and *processes*.

**Scientist**

The primary goal is the expansion of *knowledge* and *understanding* physical processes.
What is a Profession?

• Requires specialized and highly skilled knowledge
• Requires an academic training
• Regulated by professional bodies
• Examination of competence
• Vital to society
• Compensation is higher than other occupations
• Enforces high standard of legal and ethical conduct
Is Engineering a Profession?

Engineering possesses those attributes that typically characterize a profession

- Satisfies an indispensable and beneficial need
- Requires the exercise of carefulness and judgment
- Involves activities that require knowledge and skill not commonly possessed by the general public
- Has group consciousness for the promotion of knowledge and professional ideas and for rendering social services
- Has a legal status and requires well-formulated standards of admission
The Engineering Profession

- Engineering is a career based on **logical, systematic problem solving**, generally in high-tech, industrial, or scientific fields.

- Whether the end result is a product, a process, a system or service, engineers need to consider **safety, reliability, and cost-effectiveness**.
What Engineers Do?

• Design **products**

• Design **machinery** to build and test these products

• Design **Plants** in which those products are made

• Design the **systems** that ensure the **quality** and **efficiency** of the manufacturing process

• Design, **plan and supervise** the **construction** of buildings, highways, transit systems.

• **Develop** and **implement** ways to extract, process and use raw materials such as petroleum and natural gas

• **Exploit resources** to **satisfy** the nations needs
Elements of Professionalism

- Competence
- Integrity
- Responsibility and Accountability
- Public Obligation
Elements of Professionalism (contn’d)

1 Competence

• Relevant, up-to-date knowledge and capabilities in a given area
• Appropriate non-technical competences: communication, business, leadership and management skills
• A broader foundation of relevant experience and understanding
• Relevant qualifications
• Continuing Professional Development
Elements of Professionalism (cont’d)

2 Integrity

- A clear commitment to abide by a **code of ethics** which is recognized and administered by the professional community.
Elements of Professionalism (contn’d)

3 Responsibility and Accountability

• A set of personal obligations and responsibilities which sit alongside the contractual obligation to an employer or client.

• A matching accountability which is also separate from that of an employer.
Elements of Professionalism (cont’d)

4 Public Obligation

- Regard for and contribution to the public good
- Protect the public interests
- Social responsibility
- Commitment and contribution to the professional community