Introduction to Engineering (ENGN101)

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Chapter One

Introduction to the Engineering Profession

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Chapter One
Introduction to the Engineering Profession

• Do I really want to study engineering?
• What is engineering and what do engineers do?
• What are areas of specialization in engineering?
• How many engineering disciplines are there?
• Do I want to become a Chemical engineer, or Civil engineer, or Electrical engineer or Architect.
• How will I know that I have picked the best field?
• Will the demand for any area of specialization be high when I graduate, and beyond that?
What is engineering and what do engineers do? Engineers are problem solvers.

- **Good engineers** have a firm grasp of the fundamental principles that can be used to solve many different problems.
- **Good engineers** are analytical, detailed oriented, and creative.
- **Good engineers** have a desire to be life-long learners. For example, they take continuing education classes, seminars, and workshops to stay abreast of new innovations and technologies.
Engineers are problem solvers.

- **Good engineers** have written and oral communication skills that equip them to work well with their colleagues and to convey their expertise to a wide range of clients.
- **Good engineers** have time management skills that enable them to work productively and efficiently.
- **Good engineers** have good “people skills” that allow them to interact and communicate effectively with various people in their organization.
Engineers are problem solvers.

- **Good Engineers** are required to write reports. These reports might be lengthy, detailed, and technical, containing graphs, charts, and engineering drawings. Or may take the form of a brief memorandum or an executive summary.

- **Good Engineers** are adept at using computers in many different ways to model and analyze various practical problems.

- **Good engineers** actively participate in local and national discipline-specific organizations by attending seminars, workshops, and meetings. Many even make presentations at professional meetings.
Engineers are problem solvers.

- **Good Engineers** generally work in a team environment where they consult each other to solve complex problems.
- **Good Engineers** have a good interpersonal and communication skills have become increasingly important now because of the global market.
• Question: Why you choose Engineering?
A college freshman, tried to explain to a senior citizen sitting next to him why it was impossible for the older generation to understand his generation.

"You grew up in a different world, an almost primitive one " the student said, ...the young people of today have grown up with HDTV, cell phones, space travel and spaceships visiting Planet. We have nuclear energy, electric and hydrogen cars, computers with light-speed processing...and”,

The Senior citizen took advantage of the break in the student's explanation and said,
"You're right, son. We didn't have those things when we were young, so we invented them, designed them, tested them, mass-produced them
Do I really want to study engineering

How / Why did you select engineering as your major?

1. “Because of the engineering classes at my high school”
2. “I did well in math or science.”
3. “My mother told me “be an engineer or die”.”
4. ”My father and brother are engineers.”
5. “I’ve always been curious as to how things work.”
6. “I like to fix things”
7. “I heard that the salaries are higher than for other majors”

(““ students answers)
Guess what?

Most engineers discover engineering in Colleges and Universities.

Family and friends have a lot of influence on our decisions.

At the end, however, it is your decision.
Engineering is....

- A Profession
- Design
- Development
- Test
- Assembly/Production

- Engineering is also
  - Team Work
  - Communication
  - Ethics
The “Magic” We Call Engineering

Idea

ENGINEERING PROCESS

Product/service

Idea’s are the theory
Science/Math vs. Engineering

- **Science**: Study the laws of nature
  - Generates new knowledge.
- **Engineering**: Converts science into technology
  - Technology into useful products.

It requires creativity, judgment, imagination, experience,

- **What About Math**: One of the best engineering tools
What Do Engineers Do?

• Make products and provide services.
• Design and supervise the construction building, dams, highways, etc.
• Design and maintenance of infrastructure as communication systems, public utilities, etc.
• Develop new, advanced materials to make products higher and stronger.
• Play role in extract petroleum, natural gas, etc.
• Some engineers work as sales representative for products
Engineering Functions

The focus of an engineer’s work typically falls into one or more of the following areas:

- **Research** - explore, discover and apply new principles
- **Development** - transform ideas or concepts into production processes. *Develop* and *implement* ways to extract, process and use raw materials such as petroleum and natural gas.
- **Design** - link the generation of ideas and the production
Engineering Functions

- Production and testing - manufacture and assemble components or products
- Sales - market engineering products
- Operations - maintain equipment and facilities
- Construction –
  a-prior to construction organizes bids,
  b-during construction supervises certain components of process
Engineering Functions

- **Management** - optimize the use of resources (equipment, labor, finances)
- **Education** - teach engineering principles in university and industrial settings
- **Consulting** - provide specialized engineering services to the clients. May work alone or in partnership other engineers.
Class Exercise

• Observe your own surroundings. What are some of the engineering achievements that you couldn’t do without today?
What is Engineering?

• Engineering is an important and learned profession.

• Engineering is the process of producing a technical product or system to meet a specific need.

• Engineering is the art of applying scientific and mathematical principles, experience, judgment, and common sense to make things that benefit people.