

The background of the slide is a technical drawing of mechanical parts, including gears and a shaft, overlaid with a semi-transparent blue filter. In the foreground, there are several mechanical tools: a pair of glasses, a pair of pliers, and a ruler. The text is centered over the drawing.

# Design Engineer

Introduction to Mechanical Design, Prof. Keun Ryu  
Team Name : Please Do not hibernate (잠수타지말아조)  
고민지, 박경원, 박광민, 이현수, 조윤수

# Table of Contents

1. **Justification:** why is this important?
  - ✓ What is **Design Engineer** and why should we know it?
2. Outline of Contents
3. Technical Contents
  - ✓ Introduction of different companies with **Design Engineers**
4. Conclusions : What was learned?
5. The road ahead
6. Support Material: References
7. Q & A

# 1. Justification: why is this important?



## What is Design Engineer?

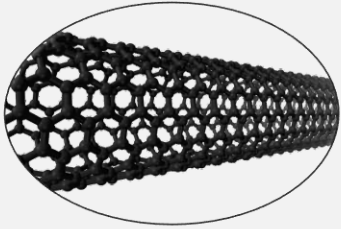
Design engineers study, research and develop ideas for new products and the systems used to make them.

Also, they modify existing products or processes to increase efficiency or improve performance.

## Why should we know it?

Design engineer is the job that we can be. So, our team want this presentation is helpful to achieve goals.

## 2. Outline of Contents

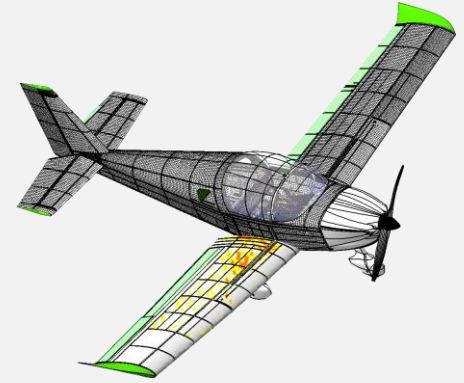


Textile Design  
Engineer

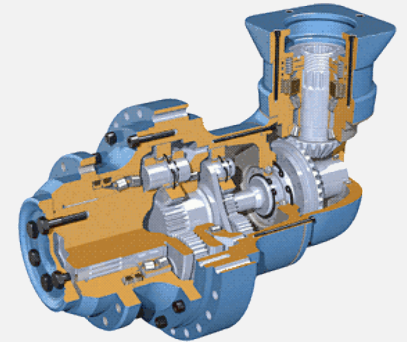


Civil Design Engineer

# Different kinds of companies in mechanical department



Aerospace  
Design Engineer



Mechanical Design  
Engineer





## Electric-Car and Battery Manufacturing Company

**Main products** : Electric cars and batteries

**Role – Mechanical Design Engineer**

- Keep up and refine the battery enclosure for the Tesla model platform
- Plan and convey nook outlines for future Tesla Program

**Required Skills**

- Comprehension about effective product design
- Experience in injection molding, extrusion, metal stamping, die casting, forging
- Understanding mechanical structures and how they are joined in high volume production
- CAD and packaging proficiency
- Experience with product and process validation

**Impacts on the society**

- Contribute to the environment of the next generation by creating a cleaner car than traditional ones that use fossil fuels to create many environmental problems.



2016 Tesla Model S



Space Exploration  
Technologies Company

**Main products** : Spacecrafts

**Role - Avionics Design Engineer**

- Develop electro-mechanical design of wire harnesses within rocket launch vehicles and capsules
- Perform analysis and physical testing of harnessing with respect to thermal, loads, vibration and shock to ensure full qualification for flight

**Required Skills**

- Proficiency with SIEMENS NX
- Experience with wire harness 3D Design, Drawings and form
- Passion for advancing the commercial space industry and space exploration

**Impacts on the society**

- Space exploration by delivering highly reliable vehicles
- Use retro-rocket technology can greatly reduce cost when launching a rocket and also reduce damage to the marine ecosystem



SpaceX's Falcon 9

# SIEMENS

Conglomerate(Multi-industry)  
Company

**Main products** : Automation and industrial plant related products, energy-related products, lighting, medical products

**Role – Mechanical Design Engineer**

- Make sustainable energy more economical to building intelligent infrastructure

**Required Skills**

- 3D modeling and 2D detailing in close cooperation with engineers in other areas
- Experience with Siemens NX
- Participates in prototype assembly in workshop and implement learnings
- Excellent command MS Office applications

**Impacts on the society**

- Create everything from smart factories to decentralized energy systems
- Make artificial intelligence-driven self-organizing Internets-of-Things possible



Siemens' Smart  
Manufacturing



## The Aerospace and Air Defense Company

**Main products** : Commercial jetliners and defense, space and security systems

**Role – Digital Unit Design Engineer**

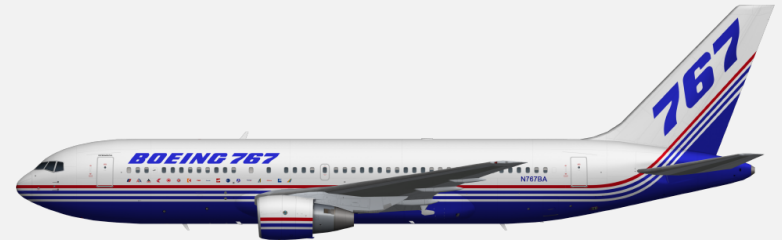
- Responsible for the successful development, build, integration, test and certification/verification of the mechanical systems installed on the aircraft
- Validates designs through various point of review, analysis. Identifies, tracks and statuses technical performance measures to measure progress and ensure compliance with requirements.

**Required Skills**

- Experience in mechanical system design
- Experience in creating design using CAD tools

**Impacts on the society**

- Make human being arrive anywhere
- Make people able to move more rapid and safe



Boeing 767-300





## Household Appliances Manufacturing Company

**Main products** : Household appliances

**Role – Mechanical Design Engineer**

- Idea factory of Dyson
- Produce high quality reliable products
- Sketching, prototyping, testing, failing and refining follow

**Required Skills**

- Experience in plastic part design, tooling, plastic injection molding, assembly process, statistical process control
- 3D CAD and technical drawing
- Good understanding of prototyping and product verification testing
- Good knowledge in component manufacturing process and techniques

**Impacts on the society**

- High-performing, energy-efficient designs
- Dyson machines can be reused or recycled



Dyson DC58  
Animal Handheld Vacuum

## Compare

Generally, design engineers use **technical and mechanical knowledge** to create **innovative solutions** to problems across a diverse range of industries.

Require **3D Modeling Skills** and **knowledge about its companies**.

## Contrast

	Tesla	SpaceX	Siemens	Boeing	Dyson
Main-Products	Electric car	Spacecraft	Social Infrastructure	Aerospace	Household appliances
Main-Technology	Electric battery	Vertical takeoff, Vertical landing (VTVL)	Industrial Automation	Jet engine	Cyclone

## 4. Conclusions : What was learned?



I was not familiar with the roles of 'Design Engineer'. I thought that this job designs appearance and shape. After I researched about it, I learned that it is an engineer who makes and designs machines effectively using CAD program.

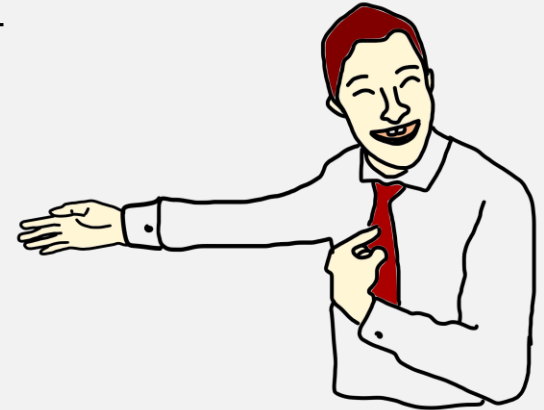
I learned that we have to acquire knowledge of 3D CAD modeling, fundamental physics and dynamics in order to be a design engineer.



The word 'design' could be interpreted in two ways, not only actual designing in terms of drafting, but also modeling which requires creative ideas and deep knowledge in engineering.

## 5. The road ahead : what you propose to do next or recommend others to do

Just as we were motivated  
by researching those 5 companies,  
I hope that this presentation  
gave you motivation.



## 6. Support material: references (ASME style)

*Digital Unit Design Engineer Jobs in El Segundo at Boeing*. [Online]. Available: <https://jobs.boeing.com/job/el-segundo/digital-unit-design-engineer/185/7436193>. [Accessed: 16-Mar-2018].

"[CASE STUDY 1]," *Mtech*, 02-Jan-2017. [Online]. Available: <http://mtech.mk.co.kr/view.php?sc=40000002&year=2017&no=1754>. [Accessed: 16-Mar-2018].

Anonymous, "Avionics Harness Design Engineer," *SpaceX*, 15-Dec-2017. [Online]. Available: <http://www.spacex.com/CAREERS/POSITION/203638>. [Accessed: 16-Mar-2018].

"Boeing," *Boeing: Career Areas*. [Online]. Available: <http://www.boeing.com/careers/career-areas/>. [Accessed: 16-Mar-2018].

"Boeing," *Wikipedia*, 14-Mar-2018. [Online]. Available: <https://en.wikipedia.org/wiki/Boeing>. [Accessed: 16-Mar-2018].

"Design engineer," *Wikipedia*, 05-Mar-2018. [Online]. Available: [https://en.wikipedia.org/wiki/Design\\_engineer](https://en.wikipedia.org/wiki/Design_engineer). [Accessed: 16-Mar-2018].

"Design Engineer (Mechanical)," *Find Jobs - Dyson Careers*. [Online]. Available: <https://jobs.dyson.com/jobs/JobDetail/Design-Engineer/5807>. [Accessed: 16-Mar-2018].

"Dyson (company)," *Wikipedia*, 15-Mar-2018. [Online]. Available: [https://en.wikipedia.org/wiki/Dyson\\_\(company\)](https://en.wikipedia.org/wiki/Dyson_(company)). [Accessed: 16-Mar-2018].

"Entry Level Structural Design Engineer job in Everett - Boeing," *Lensa*. [Online]. Available: <https://lensa.com/enrty-level-structural-design-engineer-jobs/everett/jd/f2b13bb64b32cfc55a83b93324a878d1>. [Accessed: 16-Mar-2018].

"Jobs Boeing," *Aerospace Jobs and Engineering Careers at Boeing*. [Online]. Available: <https://jobs.boeing.com/job/oklahoma-city/mechanical-systems-design-engineer/185/6543187>. [Accessed: 16-Mar-2018].

"Lean engineering," *Dyson*. [Online]. Available: <https://www.dyson.com/inside-dyson/community/lean-engineering.html>. [Accessed: 16-Mar-2018].



The background is a technical drawing with a light blue tint. It features several mechanical components: a large gear in the upper left, a smaller gear in the lower left, a pair of glasses in the upper right, and a caliper in the lower right. The drawing includes various lines, circles, and dimension lines. Some visible text in the drawing includes "φ52H7/h6" near the top gear, "118" near the bottom gear, and "85h11/h10" near the bottom right. A ruler is visible at the bottom, showing markings from 0 to 10.

**Q & A**  
**Thank you**