ME-320

# Product development and engineering design

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| Cursus | Sem. | Type |
|---|---|---|
| Mechanical engineering minor | H | Opt. |
| Mechanical engineering | BA5 | Obl. |

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|---|---|
| Language of teaching | English |
| Credits | 3 |
| Session | Winter |
| Semester | Fall |
| Exam | Written |
| Workload | 90h |
| Weeks | 14 |
| **Hours** | **3 weekly** |
| Lecture | 2 weekly |
| Exercises | 1 weekly |
| **Number of positions** | |

## Summary

The course introduces product development and the application of fundamental mechanics to develop engineering solutions. This focuses on the product development process including ideation, design selection, engineering analysis, prototyping and life cycle analysis.

## Content

## Keywords

Product design, engineering design, protoyping, CAD, design analysis, lifecycle analysis, design selection, team-work, process design,

## Learning Prerequisites

### Important concepts to start the course

- Fundamentlal of mecahnical design (gear ratios, pulleys, truss structures etc.)
- Materials properties of common engineering materials
- Awarness of CAD and the capabilities of CAD software

## Learning Outcomes

By the end of the course, the student must be able to:

- Conduct design ideation and selection for a given design specification
- Assess / Evaluate the environmenal impact of a product
- Develop engineering drawings and a protoype for a simple mechatronic product
- Integrate engineering concepts to create a product
- Apply mechanical techniques to develop an engineering solution
- Describe different components of the product design process
- Discuss the different parts of the lifecycle of a product

## Transversal skills

- Use a work methodology appropriate to the task.

- Identify the different roles that are involved in well-functioning teams and assume different roles, including leadership roles.
- Respect relevant legal guidelines and ethical codes for the profession.
- Take responsibility for environmental impacts of her/ his actions and decisions.
- Demonstrate a capacity for creativity.
- Make an oral presentation.

## Expected student activities

Students will be provided with a brief to develop an product.  In small groups (approximately 4 students), they will develop the product alongside their 'design portfolio' which includes going through the motions of a product development lifecycle.  For example, design ideation, selection, protoyping, analysis and even are review of patents in the area and pitching.  Each group of students will have an assigned TA advisor.

## Assessment methods

- 40% Written exam.  1.5 hr in length
- 60% Group design portfolio (i.e. project work)

## Resources

### Moodle Link

- https://go.epfl.ch/ME-320