

ME-320

**Product development and engineering design**

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

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	Written
Workload	90h
Weeks	14
<b>Hours</b>	<b>3 weekly</b>
Courses	2 weekly
Exercises	1 weekly
<b>Number of positions</b>	

**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, prototyping, CAD, design analysis, lifecycle analysis, design selection, team-work, process design,

**Learning Prerequisites****Important concepts to start the course**

- Fundamental of mechanical design (gear ratios, pulleys, truss structures etc.)
- Materials properties of common engineering materials
- Awareness 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 environmental impact of a product
- Develop engineering drawings and a prototype 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, prototyping, 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>