

EE-600

Usability engineering

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Cursus	Sem.	Type
Electrical Engineering		Opt.

Language of teaching	English
Credits	3
Session	
Exam	Project report
Workload	90h
Hours	45
Courses	24
Exercises	9
Project	12
Number of positions	

Frequency

Every year

Remark

Next time: Spring 2025

Summary

Introduction to Human Factors/Usability Engineering theory and research methods. Human Factors Engineering/Usability is interdisciplinary and focuses on human cognition, behavior and ergonomics in design. The course focus on human systems integration and human functions in machine/product systems.

Content

Introduction to Human Factors/Usability Engineering theory and research methods.

Examples of devices, not necessarily electronics, with reference to their usability

Definitions of Devices' Usability and related Human Factors Engineering

Human Factors Engineering/Usability is interdisciplinary and focuses on human cognition, behavior and physiology (ergonomics) in the design, development and evaluation of product components and complete products. Usability Engineering focuses on the testing/evaluation of product components and complete products to ensure users can use the product safely and effectively.

This course will focus on human systems integration and human functions in human-machine/product systems:

- Examples of devices with reference to their usability: both complete and in design
- Definitions of Devices' Usability and related Human Factors Engineering
- Human Cognition and Product Design:
- Human Perception, Human Learning, Human Memory and Attention
- Human Physiology and Product Design:
- Human Factors and the Product Design and Development Process
- Human Factors and Usability Research Methods
- Ergonomics

Applications (typically inspired by the PhD of each individual student) maybe also while not exclusively on:

1. Software
2. Medical Devices
3. Consumer Products
4. Transportation

Note

Introduction to Human Factors theory and research methods that are used to design and evaluation usable, safe, and effective devices. Application of these Human Factors methods and theories will be accomplished by means of course exercises and a final project.

Master students are welcome.

Keywords

Usability, design, human factors, biomedical.

Learning Prerequisites

Required courses

Statistics, Engineering Design Course, System design Course.

Learning Outcomes

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

- Design Design at system level product that takes into account applied Human cognitive and behavioral processes (i.e., Human Factors)
- Design Design at system level product that takes into account Human physiological characteristics: ergonomics Design usability research test
- Design Complete a usability research test, typically based on the PhD subject of each individual student at the course.
- Complete
- Use Understand and use different Human Factors standards and best practices to design a system in the following area: Software Application, Medical Devices, Consumer Products, Transportation

Teaching methods

Ex cathedra, project, and exercises

Assessment methods

Project report: oral exam, typically developed on the PhD research of each individual student.

Resources

Bibliography

- Book: Norman, D. (2013), The Design of Everyday Things. MIT Press.
- Book: Sanders, M. S., & McCormick, E. J. (1993). Human factors in engineering and design (7th ed.). McGraw-Hill Book Company

Ressources en bibliothèque

- [The Design of Everyday Things / Norman](#)
- [Human factors in engineering and design \(7th ed.\) / Sanders](#)

Notes/Handbook

Course slides

Websites

- <https://hirlan.com/about.aspx>

- <https://www.epfl.ch/labs/bci/>

Moodle Link

- <https://go.epfl.ch/EE-600>