## Remarque

Development Engineering: Innovation and Technologies in the Global South

## Summary

This course teaches the fundamentals of technologies for development (Development Engineering) to design, pilot, and evaluate appropriate, affordable and robust technologies to address sustainable development challenges (e.g. poverty, environmental degradation) in emerging and developing countries.

## Content

**Lectures:**
- Week 1 (SH): Introduction to the course and to Development Engineering
- Week 2 (SH): What is poverty?
- Week 3 (SH): Innovative technologies for poverty reduction and sustainable development
- Week 4 (SH): Design thinking
- Week 5 (SH): Quantitative and qualitative research methods
- Week 6 (SH): Guest lecturer from the Swiss Red Cross
- Week 7 (KS) EssentialTech experience and projects
- Week 8 (KS) Flipped classroom: Project strategy
- Week 9 (KS) Flipped classroom: Product Value Chain (Part I)
- Week 10 (KS) Flipped classroom: Product Value Chain (Part II)
- Week 11 (KS) Flipped classroom: Sustainable Business Model Canvas
- Week 12 (SH): Sustainability of development projects
- Week 13 (KS +SH): Presentation of group work and discussion
- Week 14 (SH+KS): Presentation of group work and discussion

## Keywords

Development, development engineering, developing countries, emerging countries, Global South, poverty reduction, social entrepreneurship, technologies for development, sustainable business models, design thinking, human-centered design, value chain canvas, scale-up

## Learning Outcomes

By the end of the course, the student must be able to:
- Explain the technology for development intervention cycle
- Integrate the principles and elements of Development Engineering
- Distinguish appropriate, affordable and robust devices, technologies or technological interventions for development
• Differentiate the main development challenges faced by emerging and developing countries.
• Compare different approaches to technological development.
• Examine information in an interdisciplinary manner integrating the contributions and expertise of different disciplines.
• Identify sustainable solutions to complex problems.
• Apply the sustainable and socially responsible value chain canvas to specific contexts.

Transversal skills
• Set objectives and design an action plan to reach those objectives.
• Access and evaluate appropriate sources of information.
• Communicate effectively, being understood, including across different languages and cultures.
• Identify the different roles that are involved in well-functioning teams and assume different roles, including leadership roles.
• Continue to work through difficulties or initial failure to find optimal solutions.
• Collect data.
• Give feedback (critique) in an appropriate fashion.
• Take account of the social and human dimensions of the engineering profession.

Teaching methods
Lectures (100% in English), group work/presentation, projection of film and discussion, and mandatory reading list.

Expected student activities
Homework, group work and presentation, mandatory reading of background material.

Assessment methods
• Presentation of group work (50%) with individual contributions of each student
• Group report (40%)
• Continuing assessment (10%)

Supervision
Office hours Yes
Assistants No
Forum No
Others Available for questions before the lectures.

Resources
Bibliography
The final bibliography will be provided during the first day of the course.

Websites
• http://www.journals.elsevier.com/development-engineering/
• http://essentialtech.epfl.ch
• http://cooperation.epfl.ch
• http://sustainabledevelopment.un.org
• http://unsdsn.org
• http://www.gapminder.org

**Moodle Link**
• http://Moodle link will be provided at course inception.

**Videos**
• http://Various TED conferences