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: Introduction to the course and to Development Engineering
Week 2: Context analysis and identification of challenges and opportunities
Week 3: Technological Development and Innovation for sustainable development and poverty reduction
Week 4: Development Technologies (e.g. m-health)
Week 5: Intervention design (human-centered design) and management: quantitative research methods for project design and management. Experimental and quasi-experimental designs
Week 6: Intervention design and management (continued): Qualitative research methods for project design and management
Week 7: Technological Development and Innovation: The sustainable and socially responsible value chain canvas: From engineering to marketing
Week 8: Technological Development and Innovation (continued): The sustainable and socially responsible value chain canvas: From assembly to commissioning
Week 9: Technological Development and Innovation (continued): The sustainable and socially responsible value chain canvas: From training to recycling and decommissioning
Week 10: Deployment, Adopting/Mainstreaming and Scale-Up: Technology / technological intervention and innovation deployment, adopting/mainstreaming and scale-up
Week 11: Deployment, Adopting/Mainstreaming and Scale-Up: Sustainable business models
Week 12: Evaluation of Development Engineering and Innovation Interventions: From theory to practice
Week 13: Evaluation of Development Engineering Interventions: From theory to practice (continued)
Week 14: Course summary and presentation of deliverable

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
• Group work and presentation of deliverable (50%)
• Exam during the summer exam session (50%)

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