Development engineering

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Cursus

| Energy Science and Technology | MA2, MA4 | Opt. |
| Environmental Sciences and Engineering | MA2, MA4 | Opt. |
| Minor in Engineering for sustainability | E | Opt. |

Language: English
Credits: 4
Withdrawal: Unauthorized
Session: Summer
Semester: Spring
Exam: During the semester
Workload: 120h
Weeks: 14
Hours: 4 weekly
Lecture: 2 weekly
Practical work: 2 weekly
Number of positions:

Remark

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 deploy appropriate, affordable and robust technologies to address sustainable development challenges and especially those related to extreme poverty in Low-income settings.

Content

Lectures:

- Week 1: Introduction to the course and to Development Engineering
- Week 2: Flipped classroom: What is poverty?
- Week 3: Flipped classroom: Sustainable development in the context of Low- and Middle-Income Countries
- Week 4: Flipped classroom: Essential Technologies 1
- Week 5: Flipped classroom: Essential Technologies 2
- Week 6: Introduction to part II of the course; EssentialTech Projects
- Week 7: Flipped Classroom: Road to Impact
- Week 8: Flipped classroom: Product Value Chain (Part I)
- Week 9: Flipped classroom: Product Value Chain (Part II)
- Week 10: Flipped classroom: Sustainable Business Model Canvas
- Week 11: Development and Peace
- Week 12: Development and Humanitarian Action
- Week 13: Finalization of group work
- Week 14: Presentation of group work

Keywords

Development, development engineering, developing countries, emerging countries, Global South, Low-and-Middle Income Countries (LMIC), poverty reduction, social entrepreneurship, technologies for development, sustainable impact, sustainable business models, value chain canvas, scale-up, PeaceTech, Humanitarian-Peace-Development Nexus.

Learning Outcomes

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

- Identify essential technologies and how they contribute to sustainable development
• Analyze affordable, sustainable, and socially acceptable technology solutions, for development
• Elaborate the interlinkages between development, humanitarian action and peace promotion.
• Carry out Development engineering projects in an interdisciplinary manner, i.e. integrating the contributions and expertise of different disciplines.
• Propose sustainable and socially responsible business solutions, adapted to the specific context of Low and middle-income countries.
• Characterize underlying causes and effects of extreme poverty, faced by emerging and developing countries.

Transversal skills
• Demonstrate the capacity for critical thinking
• Access and evaluate appropriate sources of information.
• Identify the different roles that are involved in well-functioning teams and assume different roles, including leadership roles.
• Give feedback (critique) in an appropriate fashion.

Teaching methods
Lectures (100% in English) flipped classroom, invited lectures, group work/presentation, recommended reading list.

Expected student activities
Homework, peer feedback, group work and presentation, mandatory watching of MOOC videos.

Assessment methods
During the semester
• Group report on case study (part 1 of course) (40%)
• Peer feedback (part 1 of course): Continuing assessment (20%)
• Presentation of group work (40%) with individual contributions of each student (part 2 of course)

Supervision
Others
Teachers and teaching assistants will be available to guide students in their various group works.

Resources
Bibliography
The bibliography will be provided at the beginning of the course.

Moodle Link
• https://go.epfl.ch/ENV-470