

Cursus	Sem.	Type
Advanced Manufacturing		Obl.
Microsystems and Microelectronics		Obl.

Language of teaching	English
Credits	1
Session	
Exam	Term paper
Workload	30h
Hours	14
Courses	8
Exercises	2
TP	4
Number of positions	30

Frequency

Every year

Remark

Theoretical Part: Aug. 24 & 25, 2017 - EPFL // Practical Part: Sept. 28 & 29, 2017 - Besançon

Summary

Our globalized, connected world has become more complex and demanding. Problems and challenges our society has to face has grown tremendously. Are there systematic or more creative approaches to solve them, are there tools to help us addressing technical, societal, ethical and political issues?

Content

Curriculum (Theoretical part)

1. Neurochemical basis of learning and creative processes in the brain
2. Behavioural and chemical influences on creativity
3. Personality traits of highly creative individuals (M. Csikszentmihalyi)
4. Objective testing of the originality of thinking
5. Group creativity: Brainstorming (A. Osborn)
6. Creativity training: Lateral thinking (E. de Bono)
7. Systematic problem solving (G. Polya)
8. Morphological analysis and the morphological box (F. Zwicky)
9. Lateral thinking puzzles and systematic solution approaches

Curriculum (Practical part)

1. Brainstorming exercises (Plenum)
2. Lateral thinking puzzles (Plenum)
3. Systematic solution of a tough scientific/engineering problem (Small groups)
4. Poster preparation (Groups: Problem+Process+Solution)
5. Debriefing session

Keywords

Creativity, systematic problem solving, morphological analysis, Polya approach, lateral thinking

Learning Prerequisites**Recommended courses**

Basic education (bachelor level) in an engineering or scientific discipline