EPFL

CS-210   **Functional programming**

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Cursus	Sem.	Type
Communication systems	BA3	Opt.
Computer science	BA3	Obl.
HES - IN	H	Obl.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	During the semester
Workload	150h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

Understanding of the principles and applications of declaratative programming, the fundamental models of program execution, application of fundamental methods of program composition,meta-programming through the construction of interpreters and advanced programming techniques.

Content

Introduction to programming in Scala
Expressions and functions
Classes and objects
Evaluation by rewriting
Pattern matching
Polymorphism
Evaluation strategies
Domain-specific languages
Constraint programming
Language interpretation
An interpreter for Lisp
An interpreter for Prolog

Learning Prerequisites

Required courses

Introduction to the programming objet
Theory and practice of programming

Important concepts to start the course

Compiler Construction
Foundations of Software

Learning Outcomes

By the end of the course, the student must be able to:
- Create functional programs
- Design robust and readable software
- Formalize program correctness
- Interpret programs automatically

- Prove correctness using induction
- Construct software

Transversal skills

- Demonstrate a capacity for creativity.
- Use a work methodology appropriate to the task.
- Set objectives and design an action plan to reach those objectives.
- Give feedback (critique) in an appropriate fashion.

Teaching methods

MOOC. Ex Cathedra. Exercises and projects

Assessment methods

Continuous and written test at the end of the course

Resources

Bibliography

Abelson/Sussman : Structure and Interpretation of Computer Programs, MIT Press

Ressources en bibliothèque

- Structure and Interpretation of Computer Programs / Abelson

Websites

- http://Lampwww.epfl.ch/teaching