CS-210  Functional programming
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Summary
Understanding of the principles and applications of declarative 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
Functions and Evaluation
Higher-Order Functions
Data and Abstraction
Types and pattern matching
Lists
Collections
Lazy evaluation
For expressions, generators and monads
Functions and State
Lambda calculus and Lisp
Interpreting Functional Languages

Learning Prerequisites
Required courses
CS-107 Introduction to programming
CS-108 Practice of object-oriented programming

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
• 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
• 70% exam in the exam session
• 25% programming lab assignments during the semester
• 5% written exercises during the semester

Supervision
Office hours       Yes
Assistants        Yes
Forum             Yes

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

Ressources en bibliothèque
• Structure and Interpretation of Computer Programs / Abelson
• Programming in Scala (Third Edition) / Odersky

Websites
• https://www.artima.com/shop/programming_in_scala
• https://www.scala-lang.org/
• https://gitlab.epfl.ch/lamp/cs210