

Functional Programming And Applications

Syllabus Information

CS 3510 - Functional Programming & Apps

Associated Term: 2023/24 Academic Session

Learning Objectives:

This course introduces the principles of functional programming (FP). Functional programming has become more and more popular in recent years because it promotes code that's safe, concise, and elegant, and makes it easier to write parallel code for parallel computing. You will also study how FP may be combined with other programming paradigms (eg, OOP) in languages such as Scala, a language that fuses FP and OOP in a practical package for applications. Course content :- Introduction to the basic principles of functional programming (FP) as compared to the imperative object-oriented programming such as Java; Some basic features in an FP language: recursion, abstraction and higher-order functions; Basic typing and data types such as lists and tuples; High-order functions and pattern matching; Classes and objects in a hybrid language (such as Scala); Functional paradigm as compared with the imperative paradigm; Applications (eg. In parallel programming); Basics in some advanced topics such as genericity, monads and dependent typing Learning Outcomes: Understand the basic principles of functional programming; its basic ideas, foundations, advantages as compared with imperative programming paradigm Master the fundamental programming concepts such as recursion, abstraction, higher-order functions and data types Grasp skills in developing elegant, efficient, correct, and reusable programs, using the key features in functional programming languages Understand the advantages and disadvantages of different programming paradigms as compared to each other and, on the basis of this, the basic ideas of combining different programming styles in a uniform paradigm Understand the basic foundational principles of functional programming and some of the advanced issues such as genericity, polymorphism and typing in functional programming

Required Materials: [Click here for the reading list system](#)

Technical Requirements: The total number of notional learning hours associated with the course are 150. **These will normally be broken down as follows:** 22 hour(s) of Lecture(s) across 11 week(s) 11 hour(s) of Laboratory across 11 week(s) 117 hours of Guided Independent Study **Formative Assessment:** Set Exercise **Summative Assessment:** Written Assignment (15 Hours) - 10% Written Assignment (25 Hours) - 10% Written exam (2 Hours) - 80%

