

Functional Programming in OCaml, CSCI 49201

General information

Thr, 3:10 - 5:00 pm. Hunter North 1001C.

Office hours: after the class or by appointment.

Instructor: Alexey Nikolaev

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Overview

This is a practical hands-on course on functional programming using OCaml. The goals of the course are: to help you learn the functional programming paradigm, and more broadly, to improve your ability to learn any new technology or programming language, which will make you a better programmer and computer scientist.

We will be solving programming problems in class, in groups and individually. Small homework assigned every week for better material retention. A project in the second half of the semester, in which you will be implementing a program or tool of your choice using functional programming principles. A final exam at the end of the semester.

Grading

- 25% attendance and work in class
- 15% homework
- 45% project
- 15% final exam

Tentative schedule

Jan 31. Expressions. Int. Bool. If conditions. Simple function definitions.

Recursive functions.

Feb 7. Lists. Pattern matching.

Feb 14. Float. Char. String. Printf. I/O.

Scoping rules. Parentheses. Semicolon.

Feb 21. Tuples. Algebraic data types. Option type.

Feb 28. Tail-call optimization.

Mar 7. Passing functions as arguments. Higher-order functions. Iter and fold.

Mar 14. Trees and recursive data types.

Mar 21. Records.

Modules. Functors.

Mar 28. List, Set, Map. Persistent data structures

Apr 4. Mutual recursion.

Apr 11. Imperative constructs. Arrays. Hash-tables. Loops. Mutable records.

Apr 18. Polymorphic variants.

Objects and row types.

May 2. Project presentations.

May 9. Project presentations.

May 16. Exam.

Academic Integrity Policy

We take academic honesty very seriously, and any violation results in an automatic F for the course along with sanctions in accordance with Hunter College procedure. Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

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