



蘇州大學
Soochow University

CS 326 Programming Paradigms

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

A programming language's primary function is to give a natural way to describe algorithms and computational structures, and the primary goal of this course is to teach students how to utilize programming languages and paradigms effectively. Different interpretations of "natural" have resulted in numerous unique language patterns known as paradigms. We shall investigate several key paradigms. It covers many language features and patterns, with the goal of providing you with the foundation you need to learn and effectively utilize new languages. Students will get practical experience in languages that reflect different paradigms (such as Clojure, Prolog, and Haskell). They will also be exposed to a number of other languages. Object-oriented programming, functional programming, declarative programming, concurrency, and distributed computing will all be covered.

Upon Completion of this Course, students will be able to:

1. Have gained a thorough knowledge of functional, logic, and object-oriented programming paradigms.
2. Learn the ideas and vocabulary used to define languages that enable imperative, functional, object-oriented, and logic programming paradigms.
3. Have built programs in functional and logical programming languages that use the characteristics common to those paradigms, obtaining a working knowledge of programming in those paradigms.

PREREQUISITES

CS 231 Systems Programming, CS 258 Data Structure and Algorithms.



GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

| ITEM | POINTS |
|-------------|------------|
| Quizzes | 15 Points |
| Assignments | 20 Points |
| Midterm | 15 Points |
| Project | 20 Points |
| Final Exam | 30 Points |
| Total | 100 Points |

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

Maurizio Gabbrielli, Simone Martini. (2010), *Programming Languages: Principles and Paradigms*, Springer.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

| MODULE | TASKS |
|----------|---|
| Module 1 | Topics: Topic 1: Abstract Machines. Topic 2: Implementation of a Language. Topic 3: How to Describe a Programming Language. Topic 4: Foundations. Assessments: |



| | |
|----------|--|
| | Quiz#1 Assignment#1 |
| Module 2 | Topics: Topic 5: Names and The Environment. Topic 6: Scope Rules Topic 7: Techniques for Memory Management. Topic 8: Dynamic Management. Assessments: Quiz#2 Assignment#2 |
| Module 3 | Topics: Topic 9: Control Structure. Topic 10: Structured Programming. Topic 11: Control Abstraction. Topic 12: Data Types. Assessments: Midterm Project |
| Module 4 | Topics: Topic 13: Scalar Types. Topic 14: Composite Types. Topic 15: Data Abstraction. Topic 16: The Object-Oriented Paradigm. Assessments: Quiz#3 Project due |
| Module 5 | Topics: Topic 17: The Functional Paradigm. Topic 18: Programming in a Functional Language. Topic 19: The Logic Programming Paradigm. Topic 20: A Short Historical Perspective. Assessments: Final Exam |

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.



Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACADEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university



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administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.