



蘇州大學
Soochow University

CS 376 Intermediate Computational Programming

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email:TBA

COURSE OBJECTIVES

This course builds upon the foundational concepts introduced in CS 276, delving deeper into intermediate topics in computational programming. Topics mainly cover object-oriented and dynamic programming, advanced data structures, data visualization, optimization techniques, and the integration of computational tools. This course will equip students with advanced programming skills for solving complex scientific problems.

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

1. Gain a deeper understanding of concepts and theories in object-oriented and dynamic programming.
2. Implement and analyze the applications of advanced data structures in scientific computing.
3. Apply efficient algorithms for solving complex computational problems.
4. Learn version control systems for collaborative coding and project management.
5. Apply integrate various scientific computing tools and libraries into programming projects.

PREREQUISITES

CS 276 Introduction to Computational Programming



GRADING

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

ITEM	POINTS
2 Quizzes	20 Points
2 Programming Projects	20 Points
Midterm	20 Points
Final Project Report	10 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:

Computation and Programming Using Python: With Application to Understanding Data. John V. Guttag, MIT Press, 2021.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Function, Scoping and Abstraction Topic 2: Summing a Square Root and a Cube Root Topic 3: Stack Frames Topic 4: Using Bisection Solve to Approximate Logs Assessments: Quiz#1



Module 2	Topics: Topic 5: Structured Types and Mutability Topic 6: Two Lists Topic 7: Common Methods Associated with Lists Topic 8: Applying a Function to Elements of a List Assessments: Quiz#2 Programming Project 1
Module 3	Topics: Topic 9: Classes and Objected-Oriented Programming Topic 10: Generating a Grade Report Topic 11: Graph Optimization Problems Topic 12: Dynamic Programming Assessments: Midterm
Module 4	Topics: Topic 13: More about Data Visualization Topic 14: Stochastic Programs, Probability, and Distributions Topic 15: Variance and Standard Deviation Topic 16: Simulating a Hash Table Assessments: Programming Project 2
Module 5	Topics: Topic 17: Understanding Experimental Data Topic 18: Lies, Damned Lies and Statistics Topic 19: Exploring Data with Pandas Topic 20: Classification Methods Assessments: Final Project Report 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 administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION



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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.