

# CMPINF 0010 Big Ideas in Computing and Information

Department of Computer Science, SCUPI

Fall 2024

## Instructor

Ziyi Wang

Email: [ziyi.wang@scupi.cn](mailto:ziyi.wang@scupi.cn)

Office: Room N527 SCUPI Building

Office Hours: Wednesday 8:00-12:00 & Thursday 13:30-17:30

## Teaching Assistants

Section 1: Baowen Zhang 张宝文 (email: [2022141520201@stu.scu.edu.cn](mailto:2022141520201@stu.scu.edu.cn))

Section 2: Zimu Zhan 詹子慕 (email: [1919969781@qq.com](mailto:1919969781@qq.com))

## Lectures

Section 1:

Monday 16:45-18:25

Wednesday 13:50-15:30

Location: SCUPI new building 212

Section 2:

Monday 13:50-15:30

Wednesday 16:45-18:25

Location: SCUPI new building 212

## Description

Computing and information systems underlie nearly every facet of life in today's highly-networked societies. Accordingly, there are many paths through the degree programs offered by the School of Computing and Information, each focusing on different aspects of the theories, practices, and applications of computing and information. This course will introduce students to a variety of core principles and important themes that cross-cut this array of computing- and information-oriented disciplines, as well as explore the types of work that individuals educated in these disciplines engage in.

## Prerequisites

There are no prerequisites for this course.

## Course Objectives

By the end of this course, you will be able to:

- Articulate intuitive definitions for each of the “big ideas” discussed in class
- Uncover and differentiate underlying computational and informational aspects of a variety of natural, social, and engineered systems
- Leverage computational and informational abstractions and ideas to navigate the technical and social issues arising at the interfaces between complex, interacting systems
- Identify the similarities and differences in methodology, applications, and abstraction that exist between computational and information disciplines
- Situate computing and information practices within a socio-cultural context
- Develop scripts demonstrating a mastery of basic concepts in the Python programming language (data structures, control flow, functions and modules)

- Navigate Unix-based systems, manipulate files, and execute programs
- Break down and back up work, as well as collaborate with others using a distributed version control system
- Generate, transform, and manipulate data using the Python programming language
- Generate and publish mixed media content on the web using Markdown and Static HTML sites

### **Applicable ABET Outcomes**

- Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- Apply computer science theory and software development fundamentals to produce computing-based solutions.

### **Textbook**

There is no required text for this course. Readings will be posted on Blackboard.

### **Grading**

Attendance	5%
Quizzes	5%
Assignments	20%
Mid-Term Exam	20%
Project & Presentation	20%
Final Exam	30%

### **Conversion from Numerical Score to Letter Grade**

[90, 100]	A
[85, 90)	A-
[80, 85)	B+
[76, 80)	B
[73, 76)	B-
[70, 73)	C+
[66, 70)	C
[63, 66)	C-
[61, 63)	D+
[60, 61)	D
[0, 60)	F

### **Communication**

All lecture notes, assignments, projects, and announcements will be published on Blackboard (<https://pibb.scu.edu.cn/>). Announcements and notifications for update on Blackboard will be

sent to QQ / email group. It is the student's responsibility to regularly check Blackboard in a timely manner.

In case you need to contact the instructor via email, please have the TA CCed and begin the email subject line with [CMPINF0010]. For other course-related questions, students are encouraged to contact the TA.

## **Class Policy**

### Attendance

Class attendance is expected and takes a share in your final grade. If a student has a valid reason to be absent from a class session, please notify the instructor beforehand.

### Homework Assignment

Homework assignment is due one week later before the class begins. A late penalty of 5% per day, up to 30% in total, is imposed on overdue homework until the solution published on Blackboard in one more week. Any questions regarding to the grading of homework assignment must be raised to the instructor and the TA within a one-week time frame.

### Exam

There will be one mid-term exam and one final exam. The final exam will be cumulative. The exams will be CLOSED BOOK, CLOSED NOTES, and CLOSED COMPUTER.

### Academic Integrity

The principles of academic integrity requires that a student to make sure that all work submitted is the student's own and created without the aid of impermissible technologies, materials, or collaborations. Academic integrity policy will be strictly followed.

## **Tentative Course Schedule**

Week	Date	Monday	Wednesday
1	Sep 16	Computing and Information	Interacting natural, social, and engineered systems
2	Sep 23	What is Information?	What is Computing?
3	Sep 30	Systems	National Day (No class)
4	Oct 7	Communication	Abstraction and Representation
5	Oct 14	Design and Affordance	Area talk – Four events that disrupted the digital age
6	Oct 21	Structure and Function	Synthesis Discussion
7	Oct 28	Computability and Complexity	Area talk – History and philosophy of artificial neural networks
8	Nov 4	Mid-term Exam	
9	Nov 11	Graphs and Networks	Area talk – The rich tapestry of hidden information in genomes
10	Nov 18	Distributed Knowledge and Computation	Synthesis Discussion

11	Nov 25	Determinism and Non-Determinism	Classification and Categorization
12	Dec 2	Accessibility of Data	Area talk – Computer science data applications in business
13	Dec 9	Social Implications of Computing and Information	Synthesis Discussion
14	Dec 16	Computing and Information	Grand Challenge
15	Dec 23	Project Presentation	Project Presentation
16	Dec 30	Course Review	New Year's Day (No class)
17	Jan 6	Final Exam	