

INFSCI0310 COMPUTATION IN INFORMATION SCIENCE (FALL 2026)

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Section 1: Monday, 8:15 – 11:00, S109

Office Hours:

Monday 13:00 – 18:00. Room N524.

Please send an email to schedule a meeting.

Course Description:

This course introduces the essential role of computational thinking in information science. Students will engage in hands-on programming to address fundamental computational challenges while exploring modern topics in information and data science. Through problem-based learning, the course aims to develop and refine students' computational skills, enabling them to adapt to new questions, methods, and data in a rapidly evolving world. The curriculum begins with fundamentals such as information representation and programming basics, advances to mathematical techniques for statistical simulation, modeling and optimization, and concludes with the application of computations in real-world scenarios.

Course Objectives:

- **Develop Computational Thinking:** Develop computational thinking to understand and break down computational problems systematically and efficiently.
- **Train Programming Skills:** Learn to design, construct, and apply Python programs to solve basic computational tasks.
- **Build Statistical Mind:** Understand fundamental statistics in information science topics for simulation, modelling, and optimization.
- **Real-World Case Awareness:** Study real-world examples where computational techniques are employed, bridging theory with practical applications.

Prerequisites:

MATH0220 Analytic Geometry and Calculus 1.

CMPINF0401 Intermediate Programming.

Textbook:

No textbook required, please focus on lecture slides.

Assessment:

Attendance	10%
Assignments	30%
Presentations	40%
Final exam	20%

List of Topics:

- Python Basics.
- Representing Information.
- A Recap of Statistical Inference.
- Stochastic Thinking and Simulation.
- Gradient Descent and Optimizers.
- Linear Regression.
- Case Study on Modern AI Applications.
- Exam Paper Solutions.

Mitigating Circumstances:

If you have a medical situation or any personal circumstances that substantially affect your study or exam. You are encouraged to contact the department or the instructor as soon as possible. With valid proof, mitigation may be applied when assessing your assignments, coursework or exam sheets.

Course Policies:

- If you miss the attendance more than once (≥ 2), you will Not be allowed to take presentations nor the final exam.
- There will be NO make-up exam, please make sure you take the final exam, otherwise you will fail on this course (regardless of the other non-exam grades).
- If you have special situations and want to ask for a leave about the next course, you need to send emails before the lecture time, any request after 8:15 am in the morning will be rejected.
- If you need to take a long leave for internship, you need to get formal proof from the institute, and request for the leave at least one week earlier than the upcoming lecture.
- Please regularly check the announcements on QQ groups and Blackboard
- Please bring urgent questions to face-to-face sessions.
- Carefully use AI tools, you need to make sure full understanding of your submissions.
- Zero-tolerance to both two persons in plagiarism.
- Late submissions cause penalties, please report mitigating circumstances early.

Learning 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.
- Apply computer science theory and software development fundamentals to produce computing-based solutions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.