



## INFO6205 Program Structure and Algorithms

### Spring 2025

#### Course Information

Course Title:	Program Structure and Algorithms
Course Number:	INFO6205
Term and Year:	Spring 2025
Credit Hours:	4
CRN:	40440
Course Format:	On-Ground
Class Time:	Tuesday and Friday 9:50 am – 11:30 am

#### Instructor Information

Instructor: Professor Handan Liu. Ph.D.  
Email Address: [h.liu@northeastern.edu](mailto:h.liu@northeastern.edu)  
Office Hours: every Monday 10:30AM -11:30AM, in person, office room shown on Canvas

#### Instructor Biography

<https://coe.northeastern.edu/people/liu-handan/>

#### Teaching Assistant Information

TBD

#### Help and Support

- We will use **Teams class group** as a main tool to help and support you. TAs will maintain this group.
- Post/send questions or concerns via Teams class group. TAs and I will respond you asap.
- You also can get help and support in TA hours and my office hours.

## Course Learning Outcomes

- 1) Comprehension of Program Structures and Algorithms: By the end of the course, students will be able to explain fundamental program structures, data structures, and algorithms. They will have the ability to analyze diverse computational challenges using various methods and tools.
- 2) Proficiency in Algorithmic Problem Solving: Upon completion of the course, students will be proficient in designing, implementing, and analyzing algorithms for tasks such as searching, sorting, and recursion.
- 3) Application of Data Abstraction and Encapsulation Principles: Emphasizing modular and reusable programming practices, students will develop proficiency in applying principles of data abstraction and encapsulation in code design.

## Course Description

This course covers fundamental programming constructs and their performance. These include lists, stacks, queues, trees, tries, and graphs. The course emphasizes several problem-solving techniques: brute force, recursion, divide-and-conquer, dynamic programming, greedy algorithms, iterative improvement and backtracking. The course also covers both theoretical and experimental measurement of performance, as well as the concept of complexity. The course will also illustrate the various design techniques with problems in graph theory as it applies to social networking paradigms. In line with the widespread use of Python in data science, understanding Python's underlying program structure and algorithms is a must for future data scientists and engineers. Python is the language of this course.

## Required Tools and Course Textbooks.

There are no specific required books for this course, but some recommended books and websites are given during the course.

Course materials are curated by me.

## Grading/Evaluation Standards

### Grading Schemes

#### Northeastern Grading Schema Template

Name	Range	Name	Range
A	100% to 94%	C	<77% to 74%
A-	<94% to 90%	C-	<74% to 70%
B+	<90% to 87%	D+	<70% to 67%
B	<87% to 84%	D	<67% to 64%
B-	<84% to 80%	D-	<64% to 60%
C+	<80% to 77%	F	<60% to 0%

### Grading Breakdowns:

Assignments	4 homework assignments	24%
Exams	3 exams for 3 parts	36%
Final Project Presentation		15%
Final Project Submission		20%
Attendance	Quickly Attendance	5%

For additional details and policies for students, see Canvas.

### Attendance/Late Work Policy

#### Attendance Policy

Students registered in MGEN courses (INFO, CSYE, and DAMG) are allowed **a maximum of 2 absences per course, with 3 or more absences resulting in an automatic 'F' for that course.** Students are expected to inform their instructors of any absences in advance of the class; if a student is sick long-term or experiences a medical issue that prevents class attendance, it is strongly encouraged that they speak with their Academic Advisor ([coe-mgen-gradadvising@northeastern.edu](mailto:coe-mgen-gradadvising@northeastern.edu)) to learn more about the Medical Leave of Absence. Should a student anticipate being unable to attend 3 or more classes, they should discuss their situation with their Academic Advisor to explore other types of leave in accordance with the University's academic and global entry expectations. International students should review the Office of Global Services webpage to understand their visa compliance requirements.

Teaching Assistants (TAs) or Instructional Assistants (IAs) will be present at each class to collect student attendance.

#### Late Work Policy

Students must submit assignments by the deadline in the time zone noted in the syllabus. Students must communicate with the faculty prior to the deadline if they anticipate work will be submitted late. Work submitted late without prior communication with faculty will not be graded.

### End-of-Course Evaluation Surveys

Your feedback regarding your educational experience in this class is particularly important to the College of Engineering. Your comments will make a difference in the future planning and presentation of our curriculum.

At the end of this course, please take the time to complete the evaluation survey at <https://neu.evaluationkit.com>. Your survey responses are **completely anonymous and confidential**. For courses 6 weeks in length or shorter, surveys will be open one week prior to the end of the courses; for

courses greater than 6 weeks in length, surveys will be open for two weeks. An email will be sent to your Northeastern University Mail account notifying you when surveys are available.

### **Academic Integrity**

A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, examinations of whatever kind, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Students are responsible for learning the conventions of documentation and acknowledgment of sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments of any kind according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors.

Go to <http://www.northeastern.edu/osccr/academic-integrity-policy/> to access the full academic integrity policy.

### **MGEN Student Feedback**

Students who would like to provide the MGEN unit with anonymous feedback on this particular course, Teaching Assistants, Instructional Assistants, professors, or to provide general feedback regarding their program, may do so using this survey: [https://neu.co1.qualtrics.com/jfe/form/SV\\_cTIAbH7ZRaaw0Ki](https://neu.co1.qualtrics.com/jfe/form/SV_cTIAbH7ZRaaw0Ki)

### **University Health and Counseling Services**

As a student enrolled in this course, you are fully responsible for assignments, work, and course materials as outlined in this syllabus and in the classroom. Over the course of the semester if you experience any health issues, please contact UHCS.

For more information, visit <https://www.northeastern.edu/uhrs>.

### **Student Accommodations**

Northeastern University and the Disability Resource Center (DRC) are committed to providing disability services that enable students who qualify under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act Amendments Act (ADAAA) to participate fully in the activities of the university. To receive accommodations through the DRC, students must provide appropriate documentation that demonstrates a current substantially limiting disability.

For more information, visit <https://drc.sites.northeastern.edu>.

### **Library Services**

The Northeastern University Library is at the hub of campus intellectual life. Resources include over 900,000 print volumes, 206,500 e-books, and 70,225 electronic journals.

For more information and for education specific resources, visit <https://library.northeastern.edu>  
Network Campus Library Services: [Northeastern University Library Global Campus Portals](#)

### **24/7 Canvas Technical Help**

For immediate technical support for Canvas, call 617-373-4357 or email [help@northeastern.edu](mailto:help@northeastern.edu)

Canvas Student Resources: <https://canvas.northeastern.edu/student-resources/>

For assistance with my Northeastern e-mail, and basic technical support:

Visit ITS at <https://its.northeastern.edu>

Email: [help@northeastern.edu](mailto:help@northeastern.edu)

ITS Customer Service Desk: 617-373-4357

### **Diversity and Inclusion**

Northeastern University is committed to equal opportunity, affirmative action, diversity, and social justice while building a climate of inclusion on and beyond campus. In the classroom, members of the University community work to cultivate an inclusive environment that denounces discrimination through innovation, collaboration, and an awareness of global perspectives on social justice.

Please visit <http://www.northeastern.edu/oidi/> for complete information on Diversity and Inclusion

### **Title IX**

*Title IX of the Education Amendments of 1972 protects individuals from sex or gender-based discrimination, including discrimination based on gender-identity, in educational programs and activities that receive federal financial assistance.*

Northeastern's Title IX Policy prohibits Prohibited Offenses, which are defined as sexual harassment, sexual assault, relationship or domestic violence, and stalking. The Title IX Policy applies to the entire community, including male, female, transgender students, faculty, and staff.

In case of an emergency, please call 911.

Please visit <https://www.northeastern.edu/ouec> for a complete list of reporting options and resources both on- and off-campus.