CS 207: Object Oriented Programming and Data Structures

College of Business & Technology

FACULTY & STAFF INFO

---

	contact	office hours
Leesha (Aisha) Shah, Instructor	lmshah2@neiu.edu	TBD (in CBT-105 or via Zoom)
Hashim Rehman, Peer Leader	H-Rehman2@neiu.edu	see link below
Rafael Puodzius, Peer Leader	R-Puodzius@neiu.edu	see link below

You can find the full Peer Leader office hours list here: https://cs.neiu.edu/peerleaders

COURSE INFO

This course provides an in-depth study of object-oriented programming and abstract data structures implementation and application. It covers inheritance and polymorphism, abstract classes and interfaces, exception handling, file operations, stacks, queues, lists, trees, heaps, and graphs. Additional topics include recursion, searching, and sorting algorithms.

Credit Hours: 5
Prerequisites: CS-200, minimum grade of C
Course Site: leesha.io/cs207
Schedule:

Lectures: recordings posted weekly on Mondays and Wednesdays
Workshops: Thursdays 8-9a, via Zoom (see Slack for Zoom link)

Materials:
[B1] Introduction to Java Programming and Data Structures, Twelfth Edition by Y. Daniel Liang. Pearson, 2019. ISBN-13: 978-0136520238.
[B2] Object-Oriented Data Structures Using Java, Fourth Edition by Nell Dale, Daniel T. Joyce, and Chip Weems. Jones and Bartlett Publishers, Inc., 2018. ISBN: 978-1-284-08909-7.

Major Topics:

- Object-oriented programming review
- Inheritance & polymorphism
- Exception handling
- File Input/Output
- Abstract data types
- Linked lists
- Stacks and queues
- Graphs
- Priority queues
- Binary search trees
- Searching and sorting algorithms

Objectives + Learning Outcomes:

- Be able to implement class extension and to use polymorphism
- Explain the uses of interfaces, their extension by other interfaces and implementation by classes
- Be able to write programs to read from and write to files
- Be able to throw and handle standard exceptions
- Be able to implement the following data structures using arrays and linked representations: Stacks, Queues, Lists, and Graphs
- Be able to use Stacks, Queues, Lists, Heaps, Trees, and Graphs for various applications, such as depth-first searches and breadth-first searches
- Understand how to use recursion to implement Binary Search Trees
- Know the different types of tree traversals
- Know how to analyze running time of algorithms using Big-O notation
- Know how to implement Merge sort, Quick sort, and Heap sort

GRADING

Grades will be determined as follows:

Homeworks (5): 30%
Self-Assessments (weekly): 10%
Workshops (weekly): 10%
Midterm Assessment: 25%
Final Exam 25%

Weighted Average	**Course Grade**
90% or higher	A
80% – 89.99%	B
70% – 79.99%	C
60% – 69.99%	D
Lower than 60%	F

HOMEWORKS

There will be homework assignments released throughout the semester. Each homework may contain programming questions as well as short answers. You will typically have about 2 weeks to complete the homeworks. See the Week-By-Week plan below for the schedule. For every day your homework is late, you will lose 10%. If you require an extension, you must reach out to me at least 48 hours before the deadline.

Turn in all homeworks electronically via Desire2Learn (D2L). Include all files in a folder with your name, and create a zip file, named using the following convention: LShah_HW3.zip. If you submit incorrect files (i.e. a homework that belongs to a different course, does not contain the answers, a corrupt file, etc), you will receive the late penalty above until resubmitted.

You may work with up to one other peer on the homeworks. If so, you must include both your names in the submission file name (e.g. LShah and RAdler HW3.zip), and you both need to submit. If I determine that you have copied your solutions from online or find near-identical submissions (without working as a team), you will receive a '0' for that assignment. If it happens again, you will receive an 'F' for the course and may be subject to further academic discipline as per NEIU Student Code.

WORKSHOPS

You will have weekly workshop sessions with your Peer Leaders. Full points are given for earnestly attempting the assignment, and submitting your work on D2L. Workshop assignments are due on Fridays at 11:59p. Late submissions are not accepted.

SELF-ASSESSMENTS

To promote self-direction, you will complete a self-assessment every week to evaluate your ways of working, and identify areas of improvement as you progress through the course. To promote help-seeking habits, you are recommended to visit office hours (of instructor, Peer Leaders, CS Tutors) once a week. Self-assessments will take the form of a spreadsheet shared between you and the instructor. Weekly self-assessments and office hours visits must be completed on Fridays at 11:59p. Late submissions will not be accepted.

MIDTERM ASSESSMENT AND FINAL EXAM

There will be one midterm assessment and one final exam. The midterm will take the form of a programming project. The final exam will be independent, closed book, and closed notes. Talking, helping, or receiving help from another individual (other than me) online or offline will be considered cheating.

WEEKLY PLAN

---

* This schedule is subject to change. Changes will be reflected here and announced in lecture.

Week	Topic	Assignments
0	Course Intro, OOP review Workshop 0	Read B1:Ch9, B2:Ch1
1	OOP review Workshop 1	**HW 1 released** Read B1:Ch10, B2:Ch1
2	Inheritance, polymorphism Workshop 2	Read B1:Ch11, B2:Ch1
3	Exception handling, file input/output Workshop 3	**HW 1 due Monday at 11:59p** **HW 2 released** Read B1:Ch12
4	Abstract classes, interfaces Workshop 4	Read B1:Ch13, B2:Ch2
5	ADTs. Linked lists Workshop 5	**HW 2 due Monday at 11:59p** **Midterm released** Read B2:Ch2
6	Stacks Workshop 6 - midterm project session	Read B2:Ch2 **Midterm P1 due Monday at 11:59p**
7	Recursion Workshop 7	Read B2:Ch3 **Midterm P2, P3 due Monday at 11:59p**
	SPRING BREAK - NO CLASSES	
8	Queues Workshop 8	**HW 3 released** **HW EC released** Read B2:Ch4, Ch6
9	Lists Workshop 9	Read B2:Ch7

10	Binary search trees - Part 1 Workshop 10	**HW 3 due Monday at 11:59p** **HW 4 released** Read B2:Ch7, Ch11
11	Binary search trees - Part 2 Workshop 11	Read B2:Ch11
12	Sorting algorithms Workshop 12	**HW 4 due Monday at 11:59p** **HW 5 released** Read B2:Ch9, Ch10
13	Graphs Workshop 13	Read B2:Ch10
14	Review Workshop 14	**HW 5 due Monday at 11:59p** **HW EC due Monday at 11:59p** **HW revisions due Monday at 11:59p**
15	*FINALS WEEK*	**Final Exam (scheduled D2L common exam)**

COURSE POLICIES & STATEMENTS

Lecture Recordings:
In this class software may be used to record live class discussions. As a student in this class, your participation in live class discussions may be recorded. These recordings will be made available only to students enrolled in the class, to assist those who cannot attend the live session or to serve as a resource for those who would like to review content that was presented.

Academic Integrity Policy:
By enrolling in this course, you are bound by the NEIU Student Code of Conduct: http://www.neiu.edu/university-life/student-rights-and-responsibilities/student-code-conduct. You will be informed by your instructor of any additional policy specific to your course regarding plagiarism, class disruptions, etc.

ADA Statement:
NEIU is committed to the success of all of our students. We recognize that each student brings valuable experiences and abilities to their education. NEIU faculty are ready to support you in whatever ways will allow you to achieve your goals, and this includes making sure you have access to and are able to fully engage with our course. Whatever the abilities or disabilities (both visible and invisible) you bring to the table, please know that you are welcome here and your success is our mission. Please do not hesitate to contact your instructor with any questions or concerns about your access to the course.

Northeastern Illinois University (NEIU) complies with the Americans with Disabilities Act (ADA) in making reasonable accommodations for qualified students with disabilities. Please contact

Student Counseling Services (773-442-4650) and/or Student Disability Services (SDS) for help with accommodations. SDS is located in room D104 and can be contacted at (773) 442-4595 or sds@neiu.edu. Visit the website for more information: http://www.neiu.edu/university-life/student-disability-services. SDS is committed to fostering inclusion and full participation of students with disabilities in all aspects of their University experience. If you already have an accommodation letter, please send it to your instructor.

Campus Safety:
Emergency procedures and safety information can be found at neiu.edu/police. Download the CampusShield app on Google Play or the App Store for enhanced public safety services, including emergency text notifications via Northeastern's N-Safe system.