CS 114 COURSE SYLLABUS – FALL 2024

NJIT ACADEMIC INTEGRITY CODE: All Students should be aware that the Department of Computer Science takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the instructor.

CS 114: Introduction to Computer Science II (Basic Data Structures and Algorithms)

Number of Credits: 3

Course Description: This course is an introduction to the study of data structures and algorithms, including implementations in the Java programming language. At the conclusion of the course, students will be able to solve problems using standard data structures and algorithms, and be able to bound the resources used by an algorithm.

Prerequisites: CS 113: Intro to Computer Science I

Course Objectives (what you are expected to know to complete this course)

1. Understand basic mathematical concepts such as functions and sets.
2. Know basic concepts in Java, debugging and OOP.
3. Understand run time complexity of algorithms and the use of asymptotic notations.
4. Write and analyze recursive programs.
5. Use different sorting techniques and understand their differences.
6. Understand and use abstract data types and interfaces such as: Arrays, lists, stacks, queues, priority queues and dictionaries.
7. Understand implementations for ADT's and their differences.

Textbook: Data Structures & Algorithm Analysis in Java, Edition 3.2, by Clifford A. Shaffer, Dover, 2011. ISBN: 0486485811.
Free on author's web page:
https://people.cs.vt.edu/shaffer/Book/JAVA3elatest.pdf

Exercices and code are found on the open-DSA project page :

https://opendsa-server.cs.vt.edu/ODSA/Books/Everything/html/

Software: This class requires you to bring your laptop. Please have java installed on your machine. We will be working with eclipse IDE.

Grading Policy: The final grade in this course will be determined as follows:

▪ **Homework and labs:**	20%
▪ **Midterm 1:**	22%
▪ **Midterm 2:**	23%
▪ **Final Exam:**	35%

A	B+	B	C+	C	F
90	80	70	65	60	< 60

Drop Date: The last day to withdraw with a **W** is November 11th. This is a university deadline, and will be strictly enforced.

Homework: In CS 114, the homework assignments are a significant part of the learning process, and will include both programing assignments, and theoretical questions. Please notice that the use of AI for coding assignments is NOT allowed, and grader or instructor may ask you to explain a coding solution if it is unclear. Please write comments on your code to make it readable and easy to grade.

Homework assignments are published on canvas, and are due about one week afterwards. Please upload your solutions in the format stated in the assignment.

Late assignments will lose 20% for every day or part of the day it is late. An assignment not submitted will get 0 marks. Students can, and should, work with peers; however, individual work must to be submitted and names of collaborators mentioned at top of the paper. **Unexplained answers will not receive credit**.

Labs: Lab activities will include coding exercises to be completed during class time. Labs will be submitted at the end of class using canvas and will be graded.

Exams: CS 114 will have two midterms and a final exam. Midterms will take place during regular class time and will be announced in advance. The first midterm will

include all topics till the midterm. The second midterm will include topics that were covered after the first midterm. The final exam will include all topics covered throughout the semester. Unexcused absence will result in 0 marks on the midterm. In case of excused absence, a grade for the midterm will be inputted from final exam and the other midterm. If extra time is needed on an exam, please contact the OARS office in advance to schedule the exam in their office (at the same time as your section). Please make sure to have a fully charged laptop / tablet that you can use for the exam. The device must have a LockDown browser installed. If you do not have a device, it is possible to borrow a device from the library.

Attendance: Attendance at all classes will be recorded and is **mandatory**. Please make sure you read and fully understand the Department's Attendance Policy. This policy will be **strictly** enforced. Absences from class will inhibit your ability to fully participate in class discussions and problem-solving sessions and, therefore, affect your grade. You are responsible for everything that happens in class whether you are present or not.

Makeup Exam Policy: There will be NO MAKE-UP EXAMS during the semester. In the event the Final Exam is not taken, under rare circumstances where the student has a legitimate reason for missing the final exam, a makeup exam will be administered by the CS department. In any case the student must notify the **Dean of Students and the Instructor** that the exam will be missed and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc., clearly stating the date AND time of the mitigating problem.

Further Assistance: Office hours will be online, Thursday 9:00 – 11:00 am

Tutoring for this class is available, the tutoring schedule is available in

https://computing.njit.edu/undergraduate-tutoring-1

Cellular Phones: The use of cell phones is not permitted during class time. If there is an issue you must addend to, please do so outside the classroom.

Accommodation of Disabilities: Office of Accessibility Resources and Services (ORAS) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT. If you need accommodations due to a disability, please contact OARS via email at OARS@NJIT.EDU. The office is in Kupfrian Hall Room 201. For further information please visit the ORAS office website at: https://www.njit.edu/accessibility/

Please notice, if you are eligible of extra time and would like to use it in the midterm or the final, please notify instructor and ORAS at least two weeks prior to the exam so that accommodations can be made.

Course schedule

Week	Topic	OpenDSA
Week 1	Basic math concepts	Chapter 6
Week 2	Java introduction	Chapter 4
Week 3	Run time analysis	Chapter 8
Week 4	Basic sorting, debugging	Chapters 13, 3
Week 5	Midterm 1	
Week 6	Arrays, lists	Chapter 9
Week 7	Stacks, Queues	Chapter 9
Week 9	Recursion	Chapters 5, 10
Week 10	Trees, search trees, dictionaries	Chapter 12
Week 11	Midterm 2	
Week 12	priority queues	Chapter 12
Week 13	Graphs	Chapter 19
Week 14	Review	