

UNIVERSITY OF NORTH FLORIDA

SCHOOL OF COMPUTING

COP 3530 – Data Structures, Summer 2024 (10 weeks), 3 credits

Instructor – Prof. Anirban Ghosh

✉ anirban.ghosh@unf.edu

🏢 Building 15, Room 3228

☎ 904 - 620 - 1302



**Tuesdays, Thursdays + First 4
Fridays, 9:00 AM – 10:40 AM**



Building 4, Room 1705

**Office hours (in-person) – Tuesday: 11 AM to 1 PM,
Wednesday: 9:30 AM to 1 PM, or by appointment via email**

1 Course description

“Algorithms + Data Structures = Programs” – Niklaus Wirth.

In this course, you will learn about some of the essential data structures used ubiquitously in computing and how to apply them using the Java programming language to solve interesting computational problems. Program development for these problems will require the design of efficient algorithms using appropriate data structures, object-oriented program design, and design of effective tests to ensure program correctness.

2 Prerequisites

COP 3503: Programming II and COT 3100: Computational Structures

3 Textbook

None is required. Take a look at our slides to learn about the free resources.

Reference textbook (eBook is also available from the publisher). Data Structures: Abstraction and Design Using Java, 4th Edition by Elliot B. Koffman, Paul A. T. Wolfgang

4 Course plan

The following are the tentative topics to be covered (ordering and coverage may change).

- A review of Object Oriented Programming in Java
- An introduction to asymptotic analysis of algorithms: the Big-O notation
- Arrays and Linked Lists: Singly, Doubly, Circular
- Lists and Dynamic Arrays
- Stacks, Queues, and Deques

MID-TERM EXAM

VENUE: Building 15, 3rd Floor, RF-Smart Lab (subject to change)

- Recursion and recursive sorting algorithms
- Trees and Tries
- Search trees: Binary Search trees and Red-Black trees
- Maps, Sets, and Hash tables
- Priority Queues, Binary Heaps, and Heapsort
- Graph algorithms

FINAL EXAM

VENUE: Building 15, 3rd Floor, RF-Smart Lab (subject to change)

☞ *Time permitting, additional relevant topics may be covered.*

☞ *Exact exam syllabus will be announced at least seven days before the exam date.*

5 Grade distribution (excluding extra-grade)

By leveraging the extra-grade problems, you can score more than 100% in this course with sufficient effort.

- Projects (around 5): 55%
- Take-home untimed quizzes: 5% (lowest 2 score quizzes will be dropped)
- Midterm MCQ Exam: 10%
- Midterm Coding Exam: 10%
- Final MCQ exam (cumulative): 10%
- Final Coding Exam (non-cumulative): 10%

Makeup exams, quizzes, and assignments will only be given for credible, serious reasons (the passing away of a relative or a car crash on the way to the campus, for instance). Pleasure trips are not considered to be serious reasons. In the case of sickness, a doctor's note is required. Proof will be needed for conference presentations and university-sponsored trips for records. Falsification of records or reasons may lead to disciplinary action.

6 Grading scale (may be curved at the end)

LETTER GRADE	COURSE SCORE OUT OF 100
A	≥ 92
A–	≥ 88 but < 92
B+	≥ 84 but < 88
B	≥ 80 but < 84
B–	≥ 76 but < 80
C+	≥ 72 but < 76
C	≥ 70 but < 72
D	≥ 60 but < 70
F	< 60
FA	<i>Academic misconduct</i>

👉 Grades for the assignments and exams will be posted to the UNF Canvas: **canvas.unf.edu**

7 Assignment guidelines

- 👉 You must check Canvas regularly to see if new HWs or quizzes have been posted. Turn on Canvas notifications if they are not on yet.
- 👉 Deadlines for all assignments are strict. *Homeworks will not be accepted after their respective submission deadlines unless there is a serious reason (health issues, conference presentations, etc.) for your late submission. Being busy with other coursework or a job is not a serious reason to be excused.*
- 👉 *No collaboration is allowed unless mentioned explicitly in the assignments. Feel free to discuss all aspects of the assignments with your classmates (you need to mention their names); you must not do this for the exams though! However, you must not look at anyone else's solution or copy parts of it. If you do this, you are not learning and putting yourself into the perils of plagiarism.*
- 👉 *Any kind of copying from the internet is not allowed! Please do not attempt it. We know how to detect such cases. If you are found copying, you will receive zero for that assignment. In some cases, you may get an FA grade for academic misconduct.*
- 👉 *If you have consulted other resources outside of your textbook (e.g. other books or websites), please cite them (e.g. say the name of the book or the url of the website). Consulting resources is different from copying. Copying is absolutely unacceptable in this course. You must still create your own solutions in the very end.*
- 👉 *You are not allowed to post the assignments and other course materials in any online forum. Further, you must not post your solution in any online repository such as **github** and others to avoid plagiarism issues.*
- 👉 *Please avoid using nicknames and shortening of your name using abbreviations in submissions. This will help us to locate you faster in the Canvas grade-book.*
- 👉 *AI tools such as ChatGPT should not be used to solve problems in this course. Further, please do not train any AI model with the course materials.*

8 Academic misconduct policy

The School of Computing has a zero-tolerance policy and those who engage in such activities will be risking their academic career at UNF. Please review the academic misconduct policy at <https://www.unf.edu/regulations-policies/02-academicaffairs/2-0640P.html>.

9 In-class discipline

- ☞ You should always arrive on time.
- ☞ Please do not gossip inside the class while the lecture is in progress.
- ☞ Bring papers and pencils/pens. You may need them to take notes and/or participate in activities. Feel free to use laptops or tablets for taking notes.
- ☞ Be helpful and courteous to your classmates. Any form of inappropriate language use or misbehavior inside the classroom will not be accepted.

10 Communication

- ☞ Always use your UNF email address or Canvas for sending messages to me. Do not use your non-UNF email address (gmail, yahooemail, etc.) since an email sent from a non-UNF email address might not reach my UNF inbox and end up in my spam/junk folder.
- ☞ In the emails/messages, always mention your *full name* as it appears in the Canvas and also the *course name*. This will help me in assisting you faster and effectively.
- ☞ In case I fail to reply within a day, please do not hesitate to send me another email/message.
- ☞ Please check your UNF inbox and also the Canvas as frequently as you can, at least once daily. If a reply is required for some message, please do it as soon as you can.
- ☞ The class has a discord group (URL on the Canvas course page). You are encouraged to join for fast communication and to stay connected with the course. However, if you decide to join the group, you must use your full name for verification purposes.

11 Important university resources

- One-Stop Student Services: www.unf.edu/onestop/
- IT Services: www.unf.edu/its/ If you experience any problems with your UNF account you may send an email to: helpdesk@unf.edu or call the UNF Computer Helpdesk at 904-620-4357.
- Counseling Center: www.unf.edu/counseling-center/
- Academic Calendar (includes drop dates): https://events.unf.edu/academic_calendar
- Students with disabilities who seek reasonable accommodations in the classroom or other aspects of performing their coursework must first register with UNF Student Accessibility Services (SAS) located in Building 57, Room 1500. SAS staff members work with students to obtain required documentation of disability and to identify appropriate accommodations

as required by applicable disability laws including the Americans with Disabilities Act (ADA). After receiving all necessary documentation, SAS staff determines whether a student qualifies for services with SAS and if so, the accommodations the student requires will be provided. SAS staff then prepares a letter for the student to provide faculty advising them of approved accommodations. For further information, contact SAS by phone (904) 620-2769, email SAScenter@unf.edu, or visit the SAS website unf.edu/sas/.

- Military and veteran students who return from combat exposure may be utilizing the post 9/11 GI bill to continue post-secondary education goals and may need both physical and academic accommodations. Contact the Military and Veterans' Resource Center by phone (904) 620-5131 or email mvrcc@unf.edu.

12 Student health and well-being

The UNF counseling center can help students who are having difficulties managing stress, adjusting to college, or who are feeling sad and hopeless. You can reach the UNF counseling center at <http://www.unf.edu/counseling-center/> or by calling (904)-620-2602 during and after business hours for routine appointments or if you or someone you know is in crisis. Walk-in hours are 10-2 PM Monday-Friday. Crisis appointments are available.

The Victim Advocacy Program provides confidential crisis intervention services to anyone in the UNF community impacted by crime or victimization. Services offered range from emotional support to assistance navigating the criminal justice system. The Victim Advocacy Program is located in Founders Hall, Building 2, Suite 2100. Students may contact the 24-hour Crisis Helpline at (904) 620-1010. For more information visit <http://www.unf.edu/womens-center/>.

13 Non-discrimination policy

The University of North Florida (UNF) is committed to providing an inclusive and welcoming environment for all who interact in our community. In building this environment, we strive to attract students, faculty and staff from a variety of cultures, backgrounds and life experiences. While embracing these concepts, including our obligations under federal, state and local law, UNF is equally committed to ensuring that educational and employment decisions, including but not limited to recruitment, admission, hiring, compensation and promotion, are based on the qualifications, skills and abilities of those desiring to work, study, and participate in our community.

To accomplish this intent, UNF shall not commit or permit discrimination or harassment on the basis of genetic information, race, color, religion, age, sex, disability, gender identity/expression, sexual orientation, marital status, national origin or veteran status in any educational, employment, social or recreational program or activity it offers. Similarly, UNF will not commit or permit retaliation against an individual who complains of discrimination or harassment or an individual who cooperates in an investigation of an alleged violation of University Regulation. In exercising these standards, the University will not abridge either free speech or academic freedom based on its context.

The UNF President has delegated to the Office of Equal Opportunity and Inclusion (EOI) the authority and responsibility to receive, investigate, and, where appropriate, attempt to conciliate

complaints, or investigate situations or conduct alleged to be in violation of the University's Non-Discrimination, Equal Opportunity and Inclusion Regulation and Sexual Misconduct Regulation. Accordingly, any member of the UNF community who believes that they have been subjected to discrimination, discriminatory harassment, retaliation, or sexual misconduct may seek guidance, counseling and/or file a complaint by contacting EOI and Title IX Coordinator, located at Building One, J.J. Daniel Hall, Suite 1201, 1 UNF Drive, Jacksonville, Florida 32224-7699, or call (904) 620-2507 or via 711 Florida Relay for persons who are deaf or hard of hearing or those with speech impairments and/or limitations.

14 Documentation of academic activity

Students who are not marked as having engaged in academic activity by the end of the second week of classes cannot and will not be provided federal aid for the course regardless of enrollment status.

15 Attendance policy

The faculty of the School of Computing believe that students need to make their academic studies a priority during their enrollment in our programs. Due to the amount and complexity of the material, students should ensure their ability to attend the entire class period. Thus, we have developed the following attendance policy which may be used at the discretion of the course instructor:

Students who miss more than 25% of scheduled class meetings, regardless to their grades, may be asked to withdraw from the class or given an F grade in the course.

16 Continuity of instruction plan

In the event of disruption of normal classroom activities due to an emergency such as hurricane, pandemic or other unforeseen event or combination of events, the format of this course may be modified in order to enable completion of the course requirements. It is your responsibility as a student participant to be proactive during any emergency to find instructions that I will post to the Canvas which you should check daily.