

Metropolitan State University: ICS 240-02 Introduction to Data Structures

Summer 2023

4 credits

Format: In Person

Tuesdays, 6:00 pm – 9:50 pm

May 16 – August 8, 2023

Instructor and Department Contact Information

Instructor Information

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| Name: | Jessica Maistrovich |
| Email: | jessica.maistrovich@metrostate.edu |

Department Information

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| Name: | Computer Science and Cybersecurity |
| Mailing Address: | Department of Computer Science and Cybersecurity Metropolitan State University 700 7 th Street East Saint Paul, MN 55106-5000 |
| Phone: | 651-793-1742 (Janice, office manager) |

Email is the best way to reach me and will result in faster responses to you. Remember to use your Metro State email account to avoid your message going to the spam folder. I try to respond to all emails within one business day. Please resend if you have not received a response in that time frame.

About the Course

Course Description

This course provides basic introduction to data structures and algorithms and emphasizes the relationship between algorithms and programming. Students will learn intermediate object-oriented design, programming, testing and debugging. Topics include inheritance, polymorphism, algorithm complexity, generic programming, linked list, stack, queue, recursion, trees, hashing, searching, and sorting.

Prerequisites

- ICS 141 Problem Solving with Programming
- Math 215 Discrete Mathematics

Learning Methods

This course uses a variety of assignments in order to measure student outcomes. In this course you will need to:

- Write programs in Java
- Watch/listen to pre-recorded lectures
- Attend class
- **Ask questions**

Text and Supplemental Readings

The following textbook can be used as a reference:

Data Structures and Other Objects Using Java, 4th ed., by Michael Main.

ISBN-10: 0132576244; ISBN 13: 978-0132576246

Evaluation Criteria/Assignment Information

Assignments – Please Review Carefully

Context

Although the discipline of computer science and its practical applications encompass far more than simply programming, programming is the common language shared by those who practice in the field of computing. As computing professionals, no matter what your job function is, you will be expected to think logically and sequentially. You will be expected to approach problems in a methodical fashion, to experiment and to persist until you find solutions.

This course is designed to give you practice in learning how to approach problems. The most important things that you can learn from this course are how to think about problems abstractly (ignoring non-essential details in order to design solutions), how to deal with complexity by breaking problems down into smaller pieces, and how to manage your time.

When you finish this course you will be able to design and implement Java programs at an advanced intermediate level. The vehicle by which you will meet these objectives is through extensive programming practice.

Weekly activities

- Each week, you will be asked to watch the lecture videos **BEFORE THE CLASS MEETING**.

Assignments and Grading

| Activity | Grade of C | Grade of B | Grade of A |
|---------------|-----------------|------------|------------|
| Competencies | Almost All (-4) | All | All |
| Attendance | | 50% | 75% |
| Participation | | 50% | 75% |
| Project | | | 1 |

The list of graded competencies can be found in D2L.

Course Policies

Attendance

- You are expected to view the pre-recorded lectures and complete the try-its. All materials are available in D2L.
- In this course you will be practicing problem solving skills and programming concepts and techniques. I strongly recommend that you attend all class meetings in addition to viewing the pre-recorded lectures so you can ask questions, observe and practice the process of solving computer-based problems from start to finish.

COVID-19

The pandemic has changed many things at Metro State and higher education in general. It is important to be familiar with COVID-19 procedures for Metro State, and to ensure that we are in communication if you or someone close to you gets sick. All of Metro's COVID-19 procedures, including when and how you can be on campus, are on the [COVID-19 Response page](#). This spring, you must: (a) complete a [self-assessment](#) before you come to any campus location through campus access points; (b) wear a face covering at all times when on campus; (c) maintain social distancing of at least 6 feet in all campus spaces including classrooms, hallways, and entry and exit points; and (d) self-report any fever or other symptoms and stay off campus.

If you contract COVID-19 (or if someone you care for does), please contact me as soon as you are able and then complete Metro's COVID-19 [reporting form](#). The nature of this course makes it very difficult to catch up if you get behind, even if for a very good reason. Please let me know as soon as possible if you fall ill and reach out to me again when you feel well enough to resume your studies. At that time we will evaluate the likelihood that you can successfully complete all the requirements for the course. Each case will be handled on an individual basis. If you are unable to complete the requirements for the course following a COVID-19 illness, you can complete a [registration appeal](#) to request a refund.

Plagiarism and Copyright

- Academic integrity is a fundamental element of the learning process. Only by assessing your own original work can I determine whether you've learned and met the educational goals I have developed for you in this course. For that reason, we take academic integrity very seriously in our learning community. It is your responsibility as a student to read and understand Metropolitan State's *Academic Integrity Policy and Procedures*, which can be found at <https://www.metrostate.edu/academic-integrity>
- Plagiarism is defined as the act of claiming another person's work as one's own. This can be copying or copying even parts of sentences from an article, journal, internet site, another student's work, or other written work without attribution. It can also mean using another student's assignment and making minor changes. Changing a few words around in content is still plagiarism.
- More specifically, all programs and documentation must be individual and original work unless the assignment specifies otherwise. Two or more programs which closely resemble each other may result in a reduced score, a score of zero or a failing grade in the course. A pattern of

academic dishonesty may result in expulsion. Acts of plagiarism may be reported to the Associate Provost for Student Success.

- To avoid having your programming assignments look similar to someone else's, you should not look at another person's design until you have written down your own design; you should not look at someone else's code until you have written down your own code. This rule of thumb also applies to tutoring. The tutor should not assist you until you have first attempted to solve the problem on your own.
- However, it is OK to ask for help. Learning to program can be an intensely frustrating experience unless you learn when to ask for help. In general, if you spend more than 15 minutes absolutely stuck on a problem, you should ask someone else to give you a hint. However, you should *never* copy someone else's solution.
- You may request debugging help from me by zipping up your solution and emailing your program and question to me.
- Please review this excellent article on plagiarism to learn more - <https://www.plagiarism.org/article/what-is-plagiarism>

Expectations

Sometimes difficulties arise when the expectations of students and teachers are different. Here is a brief summary of what I expect from you AND a summary of what you can expect from me.

What you can expect from me:

- I will share my technical knowledge with you as effectively as I know how.
- I will grade your work and return it to you before the next class meeting (within one week).
- I will provide you with written feedback on the quality of your work. If you do not understand why you were assigned a particular grade or if my comments are not clear, I will explain more thoroughly if you ask me to.
- I will show up for class or provide a substitute teacher. I will start and end class on time.
- I will return your phone calls and emails. I will make every effort to respond within 24 hours.
- I will listen to you respectfully. I will answer your questions respectfully.

What I expect from you:

- I expect you to read the syllabus and to know the class policies outlined there.
- I expect you to seek help if you are having difficulty with your course work. I expect you to talk to me if you are having problems. If a stressful work or home situation arises which is affecting your ability to perform well, please talk to me as soon as possible.
- If you do not understand why you received a particular grade, I expect you to approach me and ask questions. I expect you to treat me with respect even if you disagree with the grade you were assigned.
- I expect you to prepare for class by listening to the pre-recorded lectures and doing the try-its.
- I expect you to show up for the synchronous online class on time and stay for the entire session except when you have an unavoidable conflict.
- I expect you to turn in your assignments. I expect them to be submitted in a timely fashion.
- I expect you to turn in individual and original work. Please be respectful of copyrights and document your sources appropriately. This means that what you turn in must be your own work and it cannot be work previously done for some other class. Nor is it acceptable to download solutions from the web. If you copy the words or code snippets of another, you must acknowledge the source. Otherwise, you have committed plagiarism. If you turn in work done

by someone else you may be assigned an F in this course. Repeated instances of academic dishonesty can result in expulsion from the University.

- I expect you to say no if another student asks you for a copy of your work. The penalty for permitting another student to copy your work is the same as if you yourself had turned in work that was not individual and original.
- I recommend that you complete the reading assignments before you come to class, particularly if you are having difficulty understanding the material.

Respect

Metro State is privileged to serve students from many different nations, racial, ethnic and religious backgrounds. Students, staff and faculty practice a variety of lifestyles and come from many walks of life. We expect our classrooms to be safe havens where the opinions, practices and beliefs of others are treated respectfully. If you feel that you are not being treated appropriately by others in the class, I ask that you bring this to my attention so that the issues can be addressed. If I offend you, I ask that you approach me to share your concern so that we can learn from each other how to live together with respect and honor.

If you do not feel comfortable sharing your concern directly with me, contact the Computer Science and Cybersecurity Department Chairman, Mike Stein, at 651-793-1476 or michael.stein@metrostate.edu or you can report any problems to be my direct supervisor, Dean Kyle Swanson, at 651-793-1681 or kyle.swanson@metrostate.edu.

Incompletes for Course

- From time to time I am asked to consider assigning a grade of incomplete. A grade of incomplete may be considered if the person requesting has successfully completed at least two thirds of the class and is a student in good standing in the class. "Good standing" means that the requester is earning a minimum of a B grade and has attended class regularly.
- Requests must be made at least 7 days prior to the last day of class.
- I reserve the right to say no to any request for an incomplete without justifying my position.

Tips for Success

1. Listen to the pre-recorded lectures and try the "Try-its" before coming to class.
2. Write down any questions that arise while you are watching the videos.
3. Find a study partner or group of partners. Exchange phone numbers and email addresses. Although I expect each of you to work independently and do your own work, the others in your group will be able to help you with syntax (compile) and logic errors.
4. Don't stay stuck!! If you cannot figure out a problem after 15 minutes of thought, ask for help. Don't waste time on syntax errors.
5. Seek tutoring help as needed.
6. Plan ahead. A good design will save you hours of coding and debugging. Do not sit down at the computer before you have thoroughly thought out the solution to the problem.

University Academic Policies & Information

University Non-Attendance and Reporting Policy and Procedure

The purpose of the Non-Attendance and Reporting Policy is to ensure Federal Title IV regulations are adhered to with respect to a student's enrollment level for the purpose of calculating and paying financial aid. While Metropolitan State University is not required to take attendance, Federal Title IV financial aid regulations require a procedure to establish that students have attended, at a minimum, one day of class for each course in which the student's enrollment status was used to determine

eligibility for the Pell Grant Program. In addition, the university needs to determine a last date of attendance for those students who receive all failing grades or unofficially withdraw. Attendance is defined based on course delivery mode. A student is “in attendance” if he or she meets the following conditions before the end of the second week of the course:

Classroom Courses –the student is present in the classroom.

Web-Enhanced (Reduced Seat Time Courses) –the student is present in the classroom or submits at least one academically relevant assignment.

Online Courses –the student submits at least one academically relevant assignment

Independent Studies – the student contacts the instructor or submits at least one academically relevant assignment

If a student does not attend the first two classes, either live and/or online, that student is automatically dropped from the course. If a student adds the course past the drop/add date, he/she will not receive points for any assignments, discussions, quizzes, or exams for which the due date has already occurred. Refer to the Non-Attendance & Reporting Policy 2259 [Policy 2259](#), and the Non-Attendance and Reporting Procedure 259 [Procedure 259](#).

Note to the student: The above description is the University Policy, but for ICS courses, participation must occur during the first week of class or the student is dropped from the course.

University Policy on Academic Progress

The university’s academic progress policy may affect students who withdraw from classes. Be aware that a W (withdraw) is different from a drop. A drop occurs at the very beginning of the term (no later than January 15 for this course), while a withdraw occurs after the first week (between January 16 and April 12 this term). Withdrawing from this class may put you at risk for academic probation. If you have questions about your situation, contact your academic advisor as soon as possible.

Academic Appeals

The university has written procedures for appealing decisions concerning grades. You should first attempt to resolve an appeal issue informally with the instructor. To file a formal appeal, you must begin the formal appeal process within 60 calendar days of the posting of the grade or evaluation. A staff member in Student Affairs serves as ombudsperson to work with students in preparing formal appeals. For details, refer to [Procedure 202. Academic Appeal Procedure](#).

Email

Metropolitan State University has designated e-mail as an official method of communication with students. **The university expects** students to be responsible for all information sent to them via their official university email account. Refer to [Policy 1050. University E-mail](#), for further information.

Student Code of Conduct

Students at Metropolitan State University deserve the opportunity to pursue an education, and it is the responsibility of the university to provide an environment that promotes learning and protects the safety and well-being of the university community. Therefore, the university establishes this Student Conduct Code. Any action by a student that interferes with the education of any other student or interferes with the operations of the university in carrying out its responsibility to provide an education will be considered a violation of this code.

The Student Code of Conduct balances individual student due process rights with the broader interests of the safety, wellbeing and academic integrity of the university community. The Office of Judicial Affairs operates with the philosophy of balancing the need for student accountability with the opportunity for education and making amends. Students are encouraged to review the [Student Conduct Code University Policy #1020](#) and the [Student Conduct Code Procedure #112](#) to understand their rights and responsibilities under the Code.

Center for Accessibility Resources

Diversity and Disability Statement:

Our institution values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please notify the instructor as soon as possible. Students with disabilities are also welcome to contact the Center for Accessibility Resources to discuss a range of options to removing barriers in the course, including accommodations.

Phone: 651-793-1549

Web: Center for Accessibility Resources

The University provides access to its programs and services by making reasonable accommodations for qualified students. Accommodations may include approval for early registration, note-takers, interpreters for the deaf, adaptive equipment, and testing arrangements.

Technology Requirements and Expectations

Computer Hardware and Software

For this course, your computer must fully pass the System Check found on the [D2L login page](#).

Students must have internet access in order to log into the D2L system multiple times per week in order to check for updates and complete required work. Your skills should include the ability to add browser plug-ins for viewing files and content presented within the course or be able to get such assistance from non-campus sources at your own expense.

File Management

Intermediate or higher level skills at file management (ability to create folders, move and rename folders and files, identify type of file by its file-extension, attach files to emails, etc.)

Anti-Virus Software

Updated virus scanning software for all files sent and received (such as McAfee Antivirus, Norton Internet Security, etc.) is required.

Computer Software

Computer skills include proficiency with using a web browser and in using the Internet to access online resources and sites as well as competence at using Microsoft Office products such as Word and Power Point.

Email

This course requires students to use their campus email account for all communication for related to this class. Emails originating from outside the campus email servers may accidentally be blocked as spam. This policy prevents viruses and spam. Please include in the subject line of your emails a brief description that summarizes the content of the email.

Additional Resources for Students

Technical Assistance

IT Helpdesk (it_desk@metrostate.edu; 651-793-1240) provides general computer assistance.

Center for Online Learning (online.learning@metrostate.edu; 651-793-1650) provides general assistance with online learning and course access. Please include your tech id number and course name and number.

Tutoring:

The Center for Academic Excellence provides tutoring services free of charge in most academic areas including programming. See <https://www.metrostate.edu/academics/success/tutoring> for more information. Or they can be reached at centerfolk@metrostate.edu or 651-793-1460. Online tutoring is available.

Veterans and Military Student Services:

Programs and support for veterans and students connected to the military. They can be reached at veterans.services@metrostate.edu or 651-763-1561.

TRIO Student Support Services:

Support for first-generation students, low-income students and students with disabilities. They can be reached at trio.center@metrostate.edu or 651-793-1525.

Counseling Services:

Mental health support for individuals and groups. They can be reached at counseling.services@metrostate.edu or 651-763-1568.

Library and Information Services:

The university's hub for information, research help, study rooms and more. You may reach them online through the [Library pages](#) on the Metropolitan State University website or at 651-793-1616.

LGBTQ+ Student Services:

Programs and advocacy for Metropolitan State University's LGBTQA community. They can be reached at 651-793-1300 or through the [LGBTQ pages](#) on the Metropolitan State University website.