



CSCI 3110 : Data Structures

INSTRUCTOR INFORMATION

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| Instructor: | Dr. Cen Li |
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| URL: | http://www.cs.mtsu.edu/~cen |
| Office Hours: | Tue, Wed, Thur, 10:30 am – 12:00 pm Others by appointment All office hours will be conducted via Zoom meetings. |

COURSE INFORMATION

Description

Course topics: The class will review object-oriented programming (OOP), array, stack, queue, pointers and linked list, the Standard Template Library (STL), and recursion. New topics include STL containers, inheritance and polymorphism, algorithm design, analysis of algorithms, internal and external sorting, indexing techniques, advanced tree structures, and graph algorithms.

Learning Outcomes

- Write object-oriented programs using advanced techniques such as inheritance, polymorphism, dynamic binding, and generic programming.
- Use "Big-O" notation to analyze algorithms.
- Design and analyze various sorting algorithms such as selection, bubble, insertion, merge, quick, radix sort, and heap sort.
- Design and implement more complicated structures such as priority queue, heap, balanced search trees, hashing tables, and graphs as classes (including search, insert, delete, and traverse elements).
- Understand and be able to apply recursion (with backtracking) to solve problems.
- Be able to write code with exception handlings.
- Produce effective and efficient programs to solve complex practical problems by choosing the most appropriate data structures and algorithms, and then use appropriate design, debugging, and testing techniques.
- Recognize the need for, and have the ability to, program in a consistent and well accepted coding style.

Prerequisites and Co-requisites:

Prerequisite: CSCI 2170 and CSCI 3080 with a grade of C or better.

Course Material and Supplies:

Text: [Data Structures and Algorithms in C++, 4th Edition](#) by Adam Drozdek.

Reference: Tony Gaddis, [Starting Out with C++ from Control Structures to Objects](#)

METHODS OF INSTRUCTION

Class Web site

All the class notes, example code, project assignments and due dates, test information are available on the course web site: [https:// www.cs.mtsu.edu/~cen/3110/index.html](https://www.cs.mtsu.edu/~cen/3110/index.html)

To access the password protected course material, use the following user name and password when prompted:

User name: mt

Password: cs

Class Attendance

Attendance is required and absences do not excuse one from class responsibilities. If for some unavoidable reason you must miss class, you should obtain the class notes and assignments from the course web page.

The Zoom lectures will be recorded and posted in the D2L course page under the tab “Videos”.

Class attendance will be taken each class day. **Attendance is determined/judged/counted by the presence during the entire Zoom class meet.**

- If a student does not miss any classes, then 3 points will be **added** to the final course average.
- If a student misses one class, then 2 points will be **added** to the final course average.
- If a student misses two classes, 1 point will be **added** to the final course average.
- **If a student is in Zoom session, but is not present when asked to answer question during the lecture, the student is considered absent from the class.**

Course Projects

Students are expected to develop around 6 Projects this semester. Each project is assigned 1 to 2 week time for completion. Since the projects in this class will be longer and more complex than the programs coded in CSCI 2170, it is important to start working on the projects as soon as possible. Students are highly recommended to start each project the day it is assigned.

Projects submitted after the due date, and within 7 days after the due date, is considered late, will be deducted 15 points.

We will use [Visual Studio Code](#) programming environment for all the projects for this course.

Project submission:

- **Each project is assigned a due date.** Submit **all** the project files in Pipeline Dropbox labelled with the Project number before the **project due date**.
- Deadline of the project is 7 days after due date. Projects submitted after due date and before deadline is considered late. **Late penalty is 15 points.**
- After deadline, Pipeline Dropbox will be closed. Students will not able to submit the project anymore

Important notices about late projects

1. Each student is given **2 late passes** for submitting projects late without penalty. If one wants to use a late pass on one project assignment to avoid 15 late penalty, One **needs to write a statement “Use pass #1 (or #2) and a brief description of the reason at the beginning comment block of the main program. Without this, your late project will be deducted 15 points.**
2. Students can use these passes when special circumstances occur, including but not limited to:
 - Military duties,
 - Athletic competitions,
 - Participation of out of town conferences,
 - Family member illness/death,
 - Personal illness,
 - Civil duties,
 - Court appearances,
 - Etc.**Use these 2 passes conscientiously.** With one project falling behind schedule, it puts more stress on completing the next assignment on time.

Academic Integrity/Misconduct

All work for this class is to be done on an individual basis.

All source code must be original. ***If it is determined that a student has collaborated with others on program assignment or test, the first offense will result in a grade of zero for the assignment/test, and the second offense will result in a grade “F” for the class.***

Programs are graded based upon design, correctness, documentation, style, efficiency and adherence to requirements. You must design, write, implement, and debug your own programs. You may discuss with others about high-level details of program design and implementation. However, the following are not allowed and will be treated as cheating:

- Show to or acquire from other students any material related to assignments such as

source code and documentation, no matter with intention or not, no matter in which form these materials are presented.

- Help or seek help from other students to debug your programs. However, you may get help from the tutors, TA, and the instructor.
- Copy, or refer to source code from the internet, other students' homework or other source (excludes textbook or materials provided by instructor), no matter with citation or not.

Students guilty of plagiarism will be immediately reported to the Vice Provost for Academic Affairs.

Homework

Weekly homework, in the form of D2L quizzes will be assigned. These homework give students opportunities to better understand concepts discussed in class, and are good preparation practices for the tests. **No late homework is accepted. No makeup homework is given.**

Tests and Final Exam

Two tests and the final exam will be given. Tests and final exam are 100 points each. **No makeup test or makeup Final is given.** The final exam is comprehensive.

In the case of missing a test/exam:

- You may use the next test score or exam score to replace the missing test score if the following conditions are met:
 - You have informed the instructor about the special circumstance that prevents you from taking the test at least one day in advance,
 - Documentation is provided for your special circumstance.
- If the condition is not met, the grade for the missing test/exam will be 0.

ASSESSMENT AND GRADING

Grading Procedure

Your overall course average in this class will be calculated based on

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| 30% | Tests |
| 15% | Homework |
| 40% | Programming Assignments |
| 15% | Final Exam |

In addition, points will be added according to the class attendance and class participation record.

Grading Scale

Letter grades will be **assigned** according to the following scale:

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| A | average \geq 90% |
| B+ | 88% \leq average $<$ 90% |
| B | 82% \leq average $<$ 88% |
| B- | 80% \leq average $<$ 82% |
| C+ | 78% \leq average $<$ 80% |
| C | 72% \leq average $<$ 78% |
| C- | 70% \leq average $<$ 72% |
| D+ | 68% \leq average $<$ 70% |
| D | 62% \leq average $<$ 68% |
| D- | 60% \leq average $<$ 62% |
| F | average $<$ 60% |

Incomplete Grades

Incomplete grades are given rarely and only in extenuating circumstances. Page 56 of the [MTSU Undergraduate Catalog](#) states: "The grade I indicates that the student has not completed all course requirements because of illness or other uncontrollable circumstances, especially those which occur toward the end of the term. Mere failure to make up work or turn in required work on time does not provide the basis for the grade of "I" unless extenuating circumstances noted above are present for reasons acceptable to the instructor." Please refer to the Undergraduate catalog for the complete Incomplete Grade Policy.

PARTICIPATION

Course Ground Rules

The following are expected of all students in this course:

- be respectful to your instructor and peers; refrain from derogatory statements, and address technical problems immediately.

Class Participation

Student participation is required in all aspects of the course. Please adhere to the following:

- adhere to all due dates and deadlines as listed in your course calendar;
- utilize the ask the class discussion board when you have questions about course content
- communicate with the instructor as a learning resource;
- check the course homepage for important announcements from the instructor.

Academic Integrity/Misconduct

Please review the information on [Academic Integrity and Misconduct](#). The instructor will be submitting materials to an online service (Turnitin.com) which will review the work

for plagiarism. Students should also review the report generated for each assignment and self-check for plagiarism. Information on how to cite work correctly is provided within the course modules or through the [University Writing Center](#). You may read more about how to avoid plagiarism from the [Office of the University Provost](#).

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Such conduct includes, but is not limited to:

- Submitting as one's own work, themes, reports, drawings, laboratory notes, computer programs, or other projects prepared by another person
- Knowingly assisting another student in obtaining or using unauthorized materials
- Submitting assignments previously used in other courses where you received credit for the work
- Improperly crediting or lack of crediting an original author's work

Students guilty of academic misconduct are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions (including expulsion from the university), which may be imposed through the regular institutional procedures as a result of academic misconduct, the instructor has the authority to assign an "F" or zero for an activity or to assign an "F" for the course. Students guilty of plagiarism will be immediately reported to the Vice Provost for Academic Affairs.

I am True Blue

As a member of this diverse community, I am a valuable contributor to its progress and success. I am engaged in the life of this community. I am a recipient and a giver. I am a listener and a speaker. I am honest in word and deed. I am committed to reason, not violence. I am a learner now and forever. I am a BLUE RAIDER. True Blue!

Attendance Reporting

Student participation is required in all aspects of the course. Please adhere to the following:

- MTSU Administration requires that instructors complete an attendance report for each course each semester. Regular class attendance is required and will be monitored by Zoom class attendance.
- During Zoom lectures, students are encouraged to have their videos turned on. Student active participation with discussions and questions are encouraged.

STUDENT RESOURCES

Technical Support

[D2L Resources](#) are available to MTSU Online Students. You can also find help for the basic D2L functions used most often directly in your D2L course under the D2L Help for Students module.

Students with Disabilities

Middle Tennessee State University is committed to campus access in accordance with Title II of the Americans with Disabilities Act and Section 504 of the Vocational Rehabilitation Act of 1973. Any student interested in reasonable accommodations can consult the [Disability & Access Center \(DAC\)](#) website and/or contact the DAC for assistance at 615-898-2783 or [DAC Email](#)

Tutoring

MTSU Online supports multiple [Online Student Services](#).

Grade Appeals

[University Policy 313, Student Grade Appeals](#), provides an avenue for MTSU students to appeal a final course grade in cases in which the student alleges that unethical or unprofessional actions by the instructor and/or grading inequities improperly impacted the final grade.

Title IX

Students who believe they have been harassed, discriminated against or been the victim of sexual assault, dating violence, domestic violence or stalking should contact a Title IX/Deputy Coordinator at 615-898- 2185 or 615-898-2750 for assistance or review [MTSU's Title IX website](#) for resources.

MTSU faculty are concerned about the well-being and development of our students and are legally obligated to share reports of sexual assault, dating violence, domestic violence and stalking with the University's Title IX coordinator to help ensure student's safety and welfare. Please refer to [MTSU's Title IX website](#) or contact information and details.

Hope (Lottery) Scholarship Information

Do you have a lottery scholarship? To retain the Tennessee Education Lottery Scholarship eligibility, you must earn a cumulative TELS GPA of 2.75 after 24 and 48 attempted hours and a cumulative TELS GPA of 3.0 thereafter. A grade of C, D, F, FA, or I in this class may negatively impact TELS eligibility.

If you drop this class, withdraw, or if you stop attending this class you may lose eligibility for your lottery scholarship, and you may not be able to regain eligibility at a later time.

For additional Lottery rules, please refer to your [Lottery Statement of Understanding form](#) or contact your [MT One Stop Enrollment Counselor](#).