CSCI 340-1 Course Syllabus Fall 2023
Data Structures and Algorithm Analysis

Course Description

The application of analysis and design techniques to nonnumeric algorithms on data structures. The utilization of algorithmic analysis and design criteria in the selection of methods for data manipulation. PRQ: CSCI 241

Textbooks

Recommended Text (*Not required for the course*)

- Data Structures and Algorithms in C++, A. Drozdek, 2013.
- Data Structure and Algorithm Analysis in C++M. A. Weiss, 2013.
- C++ Plus Data Structures, Nell Dale, Chip Weems, Tim Richards. 2016

Online resources for C++ standard library reference:

https://cplusplus.com; https://en.cppreference.com/

Assignments

There will be multiple programming assignments. Programs will be submitted electronically using system commands explained on the course web site.

Your grade is based solely on the ability to run your programs on hopper.cs.niu.edu. It does not matter if it runs OK elsewhere and then you managed to break it while handing it in.

All assignments will be graded by your TA. If you have questions about how your assignment was graded, see your TA first. If you are unable to reach an agreement with your TA about the grade on an assignment, then see your instructor. The instructor reserves the right to re-grade any assignment as they sees fit. This may result in a higher, lower, or the same as the original grade. Any protest of assignment scores must be made within one week of the day that assignment grades are posted in the Blackboard Grade Center. Any protests made after that time will not be considered.

All assignments are due at the date and time specified in the course web site or assignment handout. The time a program was submitted is determined by when it is electronically received. Late assignments will be penalized by 10% per 24-hour period that the assignment is late. All assignments submitted more than 48 hours late will receive a grade of 0 for that assignment. Programming assignments that are due the final week of class may not be turned in late - any such assignment submitted after the due date and time will not be accepted.

Under no circumstances may an assignment be turned after the solutions have been posted and/or discussed in lecture.

If you are unable to meet an assignment deadline due to illness, you must contact the instructor before the deadline. You should be prepared to verify the illness with a note from your doctor.

No agreement to accommodate a late submission on one assignment shall be considered an agreement that may apply to any other assignment.

This is a programming class. All assignments are expected to at least compile successfully. Assignments that do not compile on hopper.cs.niu.edu will receive 0 points, regardless of the amount of code submitted.

Assignments are graded based on output; coding and documentation. Output must be correct and in agreement with the specifications of the assignment. You may be required to match your instructor's output exactly, such that a comparison of your output and the instructor's output using the Unix diff command shows no differences (this is referred to as a "clean diff"). When in doubt, 1) ask your TA, 2) ask your instructor, 3) make it look professional.

Coding is graded for completeness, correctness, and efficiency. Proper style is important, including blank lines and consistent use of indentation.

All assignments must be documented in accordance with the documentation standards linked to on the course web site.

Recitation:

There is a recitation portion to this class. The idea of the recitation is to give an opportunity for students to learn how to solve problems as a group. You should make yourself available for your registered recitation section. Further details will be given.

"Daily" Tasks

These are coding exercises to be done three to four times a week. Each of the daily tasks will be worth the same weight. Note that each one may be scored with differing numbers of points. Each one will be scaled such that they will all be of equal weight when applied to your final grade. No late dailies will be accepted.

The daily programming assignments are an essential tool in developing each student's ability to program. As such, the daily programming assignments are to be completed by each student as an individual effort. Stated simply, take care to read each assignment and complete it exclusively on your own. Asking for assistance from the instructor and TA is permitted. Evidence of collaborating with others, searching the internet, etc, however, will be grounds for academic misconduct and will be treated as such.

Quizzes and Tests

There will be three to four quizzes. The quizzes will be held during the last 20 minutes of some lectures (or online).

There will be three tests. Test 1 covers the first third of course material, test 2 covers second third of course material, test 3 is a comprehensive final with more weight on the last third of the course material. The exact dates of the first two tests will be announced in class at least one week prior to the test. The last test will be administered at the date and time listed on the Final Exam Schedule.

Final Grade

Your final grade is broken down as 15% assignments, 10% daily tasks, 10% recitation, 5% for quizzes, 20% test 1, 20% for test 2, and 20% for test 3.

Your final grade will be determined based on the scale:

90+: A;

[85-90): B+;

[80-85): B;

[70-80]: C;

[60-70): D

below 60: F.

You must earn at least a 60% combined score on the Daily tasks to pass the course. You must earn at least a 60% combined score on the Assignments to pass the course. You must earn at least a 60% combined score on the Exams to pass the course.

There is no rounding up to the nearest letter grade.

Course Website

All of the material for this course, including assignments, will be distributed through the course web page in Blackboard. Check them often.

You also need a github account for submitting assignments. If you don't already have a github username, you can create one. You are strongly suggested to choose a username that is obvious who you are. For example: FirstnameLastname or FirstnameLastname-zid.

Computing Account

Every student at Northern Illinois University has a computing account, generated when you first register at Northern Illinois University. It does not change. It is the letter 'z' followed by a six or seven digit number, and is usually referred to as a "z-number" or "z-ID". If you know your z-ID from a previous semester, you can continue to use it. If you don't know your z-ID, you can call the IT Service Desk at 815-753-8100 for assistance.

If you have never used your account before, you can find the format of the initial default password posted on Blackboard.

You must have and know your z-ID by the end of the first week of classes.

Getting Help

Your TA(s) and the professor are here to help you understand the course concepts. If you have problems understanding an assignment, questions about grading, etc. seek help.

We expect you to try to solve your own problems. Seeking help from a TA or instructor is much more effective if you can explain what you did that *didn't* work. Don't expect us to give you the complete solution to your problem. Often we will only tell you where to look to solve your own problem.

One of the best ways to help yourself is to start early on the assignments. Programming is not just typing, compiling, and running. Programming involves study of the problem and planning. Some of the most important steps in programming are off-line. The sooner you begin, the better.

Your TA(s) and instructor take email inquiries. Typical response time is 24 hours, but this is not guaranteed (nights and weekends not counted). Students are encouraged to make use of scheduled office hours whenever possible and to ask questions ahead of assignment deadlines. *When asking questions via email, be specific about your problem. A well-organized question is important for getting prompt and helpful answers.*

Independent Work

Cheating in any form will not be tolerated.

The Academic Regulations section of the Northern Illinois University Undergraduate Catalog states under the section entitled "Academic Integrity":

> Good academic work must be based on honesty. The attempt by any student to present as their own work that which they have not produced is regarded by the faculty and administration as a serious offense. Students are considered to have cheated if they... turn in a paper or assignment written in whole or in part, by someone else... Students guilty of, or assisting others in either cheating or plagiarism on an assignment... may receive a grade of F for the course involved and may be suspended or dismissed from the university.

Any student caught cheating on a program, homework assignment or exam will receive a substantial grade penalty and an academic misconduct report **will** be filed. Further disciplinary action may be taken.

Willful and malicious attempts to sabotage program submission or automated grading systems will be considered academic misconduct and will be treated accordingly.

It is the student's responsibility to prevent their work from being used by others. Any/all parties submitting any work deemed substantially similar will be treated as a willful act of exchanging and copying regardless of the circumstances involved in the giving, taking, theft, or copying of said work.

If you believe that someone has stolen your work then report it to your instructor immediately.

Some discussion of assignments and mutual assistance normally is acceptable, but the discussion or assistance should not be so detailed and extensive that it begins to resemble copying. If you feel even the slightest possibility that what you are doing might be considered cheating, **do not do it!** Any assistance needed should be sought from the course teaching assistant or instructor.

Privacy Concerns

If any students have chosen to restrict the university from disclosing their student information, please contact your instructor.

Special Circumstances

Students with special needs (disability accommodation, religious observances, required military service, major illness or other unexpected events) are encouraged to contact the instructor as soon as possible. Having a lot of work for your other classes, being busy at your job, and network problems are *not* special circumstances; they are normal circumstances that everyone has.

Disability Services

If you need an accommodation for this class, please contact the Disability Resource Center as soon as possible. The DRC coordinates accommodations for students with disabilities. It is located in the Campus Life Building, Suite 180, and can be reached at 815-753-1303 or drc@niu.edu. Please contact me privately as soon as possible so we can discuss your accommodations. Please note that you will not be required to disclose your disability, only your accommodations. The sooner you let me know your needs, the sooner I can assist you in achieving your learning goals in this course.