

Principles of Operating Systems

Spring 2021

CS 480-2

TTh 2:00 PM – 3:15 PM

Online

Instructor: Dr. Reva Freedman
Email: rfreedman@niu.edu
Phone: In emergency (i.e., if email not available), call the CSCI office at (815) 753-0378, and they will forward a message.
Office hours: Wed 2:30-4:30 via Zoom or by appointment (see Blackboard or email for link)
TA: Theresa Li, Tue/Thu/Fri 9-11 AM, contact information to be provided via Blackboard

Course web site: Reference materials at <http://www.cs.niu.edu/~freedman/480/>
Most course materials will be on Blackboard under CSCI 480
Sample code will be on turing at ~t90rkf1/d480

Textbook: Silberschatz, Galvin and Gagne, *Operating System Concepts*, 10th edition

Course description:

In this course we will study the principles and practices of modern operating system design, focusing on models of operating systems architecture, scheduling, interprocess communication, and I/O. Students will demonstrate their learning of these concepts through the writing of professional-quality object-oriented C++ programs using the STL, the POSIX API, and other system software.

Course objectives:

- 1) To understand the most important concepts in operating systems and other modern system software.
- 2) To be able to use these concepts in professional-quality object-oriented C++ using the STL, the POSIX API, and other required software, with a special focus on I/O.

Contacting the instructor: I will be happy to talk to you about questions or concerns at any time, including any topic relating to this course or other relevant topics. I encourage you to address small problems before they become big problems, not the day before the exam.

I try to respond to email by the next business day, but there are occasional exceptions. Questions that can be answered from reference material may not be answered. Questions requiring major debugging are best handled in person.

If you need debugging assistance or need to send code for other reasons, send a zip file using the same format as for submissions. Do not send pictures of any textual data, i.e., copy and paste the text instead.

Late-breaking news, e.g., errors in assignments and network emergencies, will be posted on Blackboard. Personal messages will be sent to your NIU email. I suggest you check both every morning.

Your TA is generally your first and best reference for homework issues.

Class schedule: If the university is closed for any reason, class will automatically be cancelled. If other emergencies arise, class cancellations will be announced as soon as possible via Blackboard.

Class attendance: You are responsible for all material covered in class. If you miss a class, you must get notes from another student before the next class, *not from the instructor*. Research has shown that students who attend class regularly do better regardless of other behaviors.

Although many or most class materials will be posted on Blackboard, that is for your convenience. There is no assumption that you can learn everything without attending class. Similarly, although my intent is to record every lecture, due to technological challenges, I cannot guarantee that there will be a recording available for every lecture.

Class participation: Class participation is encouraged and will make the class more interesting for you and for the other students. If you have a question, there are probably three other people with the same question who are even more shy than you.

Please ask ASAP if you don't understand, if I make a mistake, or if you are just curious about something. Questions about details, big ideas, concepts, algorithms, examples, related ideas and applications are all welcome.

Class decorum: I appreciate it if students keep their cameras on, but it is not required. Please keep your camera off if you are eating. Please mute yourself when you are not talking, but feel free to ask questions at any time. Questions are always welcome in the chat.

Research has shown that activities such as texting and checking your email interfere with *your* retention of the material, however, they in general do not interfere with other people's ability to concentrate. Therefore these are permitted if you need to indulge in them.

Exams: There will be three exams, two midterms and a final. The dates of the midterms will be announced approximately one week in advance. The final exam will take place during the final exam slot, Tuesday, April 27, 2-3:50 PM. The exams will most likely be traditional closed-book, closed-notes exams, but could also be take-home exams. Exams will be conducted in accordance with the department's academic integrity policy, which is available on the course web site.

With regard to concepts, each exam will cover approximately one third of the course material (the final will not be cumulative). With regard to programming, programming is inherently a cumulative activity, so the exams may include programming constructs from earlier in the course.

Exams will include material from the lecture notes, written assignments and programs. For each exam, a review sheet will be posted listing all the possible conceptual questions (in a somewhat different format). Exam formats may include multiple choice, fill-in-the-blank and similar formats. They may also include some short functions to write (10-15 lines or so) or essay questions. You will not be required to memorize names of libraries or similar issues. Slides used in class will be posted at some point after the lectures in which they are used.

Examples for the programming questions on the exams will be available from sample code and the homework. Programming questions will assume that you have not only done the homework but learned from it, i.e., copying code from the sample programs used in class without learning from it may give you a working program but is less likely to give you the level of understanding you will need for the exams.

You are expected to take the exams on the assigned time and date. Missing an exam is an extremely serious matter: makeup exams will only be given if either (a) or *all* of (b), (c) and (d) are satisfied: (a) an unavoidable reason (e.g. car accident) with notice as soon as possible, (b) advance notification, (c) written documentation, (d) permission of instructor. For the final exam, permission of the department is also required.

Please notify me as soon as possible if you meet the university's criterion for rescheduling a final exam, i.e., you have three finals on the same day and this course is the highest-numbered of the three, or if you have another final exam at the same time. The university deadline for scheduling a makeup final is Monday of the last week of classes. Documentation will be required.

Assignments: There will be approximately 6 major assignments. Most or all of the assignments will be object-oriented C++ programs that will run on turing/hopper.

Unless otherwise specified, the following rules apply to all assignments. Assignments must be submitted as defined in the assignment writeup. You will receive 10% extra points for assignments submitted 24 hours before the deadline. There will be a penalty of 10% of the points for the assignment for each day or portion of a day for late programs, and no programs will be accepted more than 2 days late. I suggest you submit your assignments by 11:57 PM to make sure they are received on time.

In general, there are no waivers of the late penalty or extensions beyond this period. No programming assignments may be submitted after the last day of classes.

There will be penalties for not following the coding, layout, documentation and submission standards referred to in the assignment. For example, there may be penalties for not following naming conventions, not following the programming style guide, not submitting files in the correct format (including zip files), not using the assigned directory structure, not submitting all the files or submitting extra files.

All assignments submitted on Blackboard must use the naming convention specified in the assignment, including your 4-letter ID in lower case. For most people, your 4-letter ID will be the first four characters of the first word of your last name as it is recorded on myNIU. If that word contains less than 4 letters, fill it out with 0's. If two students would otherwise have the same 4-letter ID, I will assign each of you a different ID.

To receive full credit, programs must (a) run as specified in the assignment, (b) follow the specifications, (c) be comprehensible to humans, (d) be accompanied by any requested writeup. If multiple versions (e.g., source, object, and/or output) are required, they must be consistent.

You may not use external code (from other people or from the web) without permission. All programs must run in C++ on turing/hopper unless otherwise specified. I encourage you to develop them on turing, but if you don't, make sure you test them on turing before you submit

them.

If you believe your assignment has been graded incorrectly, you must see the professor or the T.A., as appropriate, within one week after the assignments have been returned.

Grading: The course grade will be based on the exams and assignments. Quizzes count as assignments. The exams will count 40% of your grade. The assignments will count 60% of your grade. All points will be counted, i.e., if you have more than 100% of the points in one section of your grade, those points will overflow into the other section. The assignments will be weighted according to length and difficulty. The grading scheme will be as follows (grades will not be curved or rounded):

Grade	Average
A	≥ 90
A-	≥ 89
B+	≥ 88
B	≥ 80
C+	≥ 78
C	≥ 70
D	≥ 60
F	< 60

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. Commuting, 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 accommodations: The instructor will provide all of the accommodations to which you are entitled by law. If you need an accommodation for this class, you must provide a notification letter from the Disability Resource Center. Once you provide a copy of the notification letter, we will have a private conference to determine how your approved accommodations will be handled in this class. This conference must be held and agreement reached before any accommodations can take effect. No accommodations will be allowed retroactively.

If you wish to take your exams at the DRC office, you must also follow DRC regulations with regard to exam scheduling.

For these reasons you should contact the DRC as soon as possible. They are located on the first floor (room 180) of the Campus Life Building, and can be reached at 815-753-1303 or drc@niu.edu. Also, please contact me privately as soon as possible to discuss possible accommodations – there is no need to wait until you have received the notification letter.

Academic integrity: You are encouraged to study together, however, that does not mean doing assignments together. Practice on problems from class, from the slides, or your own problems. Do the programs and any written assignments yourself.

You are expected to do your own work on the homework, programs and exams. Cheating

includes, but is not limited to, copying work from other students, copying work from other textbooks, copying work from the Internet, or allowing others to do the same, whether deliberately or not.

You may not post material from this class, including answers to the homework assignments, on any public web site.

All cheating will result in the filing of an academic misconduct form and will affect your course grade, with the possibility of failing the course and/or losing your student job. The penalty for a first offense is usually two letter grades. Note that a second academic misconduct offense may result in your expulsion from the university.

We may use mechanized source comparison on the programs.