

SABANCI UNIVERSITY
CS 204 - Advanced Programming
Summer 2021-2022
3 credits

Prerequisite CS201

Description and Objectives

This course aims to provide programming experience and to give advanced programming techniques. In this way, students would be more prepared for data structures and several other junior and senior level CS courses. CS204 is a prerequisite course for several CS courses including data structures. Thus, it is a must course for CS students and students who will take advanced CS courses.

The programming language that will be used in this course is C++; we will use Microsoft Visual C++ 2012 as the development environment. CS204 heavily depends on CS201. Thus, a good CS201 background is needed. We will NOT make a review of CS201 topics.

Topics Planned to be Covered

- ❖ Introduction (overview of basic concepts, Visual C++ environment, preprocessor directives, compiler, compiler options, linker, libraries, debugging)
- ❖ Pointers and dynamic memory allocation
- ❖ Linked lists
- ❖ Stacks and queues
- ❖ Templates, templated classes and templated functions
- ❖ Advanced issues on classes and object oriented programming
- ❖ Data representation, bitwise operations
- ❖ Inheritance, polymorphism and advanced object oriented design
- ❖ Exception handling
- ❖ Programming with threads
- ❖ Visual programming and graphical user interfaces (if time permits)

Instructor

Dr. Duygu Karaođlan Altop, UC 1083/1089, duygu.altop@sabanciuniv.edu
Office Hour: TBA.

Schedule

Lectures: Monday 08:40-11:30 (FASS G062), Tuesday 08:40-11:30 (FASS G062)
Labs: A1: Thursday 17:40-19:30 (FASS G052), Thursday 15:40-17:30 (FASS G052)
A2: Thursday 17:40-19:30 (FASS G049), Thursday 15:40-17:30 (FASS G049)

Assistants

Ahmed Mohamed Mahmoud Elmoselhy Salem, ahmed.salem@sabanciuniv.edu

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Detailed information (offices, office hours, etc.) will be available on SUCourse.

Textbooks

Main texts are

- "Ivor Horton's Beginning Visual C++ 2012", by Ivor Horton, ISBN: 978-1-118-36808-4.

- "A Computer Science Tapestry" (CS201 Book)

Reference books are

- "Starting out C++ Early Objects", 7th edition, by T. Gaddis, J. Walters and G. Muganda

- "Objects, Abstraction, Data Structures and Design using C++", by Koffman and Wolfgang.

We may not stick to the textbooks; you are responsible for the material covered in class too. Thus, it is very important to attend classes.

Tentative Grading (subject to change)

Quizzes	14%	
Take-home Exams	20%	
Midterm Exam		33%
Final Exam	33%	

Please note that the weighted average is not the only criterion in letter grading!

- ❖ We will have physical midterm and final exams. Details regarding the examinations will be announced later. University regulations will be followed for special cases.
- ❖ At the end of the semester, course grades will be calculated using a curve grading system. Please note that we have no intention of releasing the letter grade boundaries.
- ❖ The instructor has the right to have an oral interview for any grading item given in the syllabus.
 - Students who will have the oral interview may be selected randomly or according to a suspicious situation observed by TAs or the instructor.
 - Performance of the student in an oral examination will affect their grades of the grading item they have been called upon.
 - If a student fails to show up at an oral exam, or does not obey the aforementioned rules, (s)he will automatically get 0 (zero).

- ❖ There will be at least 4 (maybe more) programming take-home exams (THEs) during the semester. All of the assigned THEs will be graded and taken into consideration in the overall grade. Each THE will have equal weight in overall grading.
 - Your submissions will be graded automatically via GradeChecker/CodeRunner, using which you can check your expected grade before submission.
 - We might request a demo for your submission(s), and your performance might affect your THE grade(s).
 - THE grading will mostly be based on the correctness of the execution; not based on how big the mistake is or how hard you work for it. Thus, please test your code very carefully. No debugging will be done during grading. No code/file changes are allowed after the submission. If you submit the wrong file, then we cannot grade your work.
 - If you fail to submit your work via SUCourse on time, the corresponding work (i.e. grading item) will be graded as 0. No late submissions, unless stated otherwise!

- ❖ Contribution of the take-home exams to the overall grade will be calculated according to the formula given below:

$$take_home_grade = \begin{cases} take_home_avr & \text{if } ratio \leq 2 \\ take_home_avr \times (3 - ratio) & \text{if } 2 < ratio < 3 \\ 0 & \text{if } ratio \geq 3 \end{cases}$$

$$ratio = submitted_take_home_avr / weighted_exam_avr$$

$$weighted_exam_avr = (0.33 \times midterm_grade + 0.33 \times final_grade) / 0.66$$

$$course_numeric_grade = quiz_grade \times 0.14 + take_home_grade \times 0.20 +$$

$$midterm_grade \times 0.33 + final_exam_grade \times 0.33$$

- ❖ There will be at least 5 (maybe more) pop-up quizzes (exact date/time will be randomized) during the semester. These quizzes will be carried out during the lecture/lab hours. The worst of them will be discarded and the rest of them will have equal weight on grading. You must attend your registered lab section to take the quiz.

- ❖ There won't be any make-up for take-home exams in any case, including medical health reports and official university activities.

- ❖ *If your exams' weighted average is below 30, you will fail the course even if your total grade is greater than or equal to the passing grade of the course.*

- ❖ *If you miss all of the quizzes, take-home exams, midterm, and the final exam as well; then you will get an NA grade.*

- ❖ *If you miss one of the midterm/final examinations and if you do not take the make-up exam for that missing exam (check the make-up exam policy for details); then you will directly get an F grade, even if your total grade is greater than or equal to the passing grade of the course.*

Exam/Submission Review Policy

Students are allowed to object to their midterm and final examinations, as well as their quizzes and take-home exams. There will be specific objection hours for midterm and final exams. However, you can only object to your quiz or take-home exam grade within 7 days after the respective grade is announced. Grade bargaining will absolutely not be tolerated.

Make-up Policy

No make-ups are allowed for the take-home exams or the quizzes. Students automatically get 0 (zero) from the respective take-home exam or quiz grade if any of them is missed.

Make-ups are only allowed for the midterm/final examinations. Any excuses that will be taken into the instructor's account after the exam in consideration will **not** be considered.
No exceptions to these rules.

Dates and details of the make-up examinations will be announced later.

The make-up examinations will most probably be oral. That is, all of the make-ups will probably be done as a face-to-face verbal exam.

There will be a single make-up exam at the end of the semester. This make-up exam will include all the topics covered in lectures, labs and offline recordings.

You can only take the make-up exam only for one regular exam, either midterm or final. If you miss both of the midterm and final exams, you will directly fail the course.

GradeChecker / CodeRunner Tools

We apply an automated grading process on the take-home exams. You can use either GradeChecker (<https://learnt.sabanciuniv.edu/GradeChecker/>) or CodeRunner, depending on the assigned THE, to check your expected grade, before submitting your take-home exam. Just a reminder, you will see a character ¶ which refers to a newline in your expected output.

GradeChecker/CodeRunner can be pretty busy and unresponsive during the last day of the submission. Thus, leaving the submission to the last minute is not a good idea.

GradeChecker/CodeRunner and Sample Runs together give a good estimate of how correct your implementation is. However, we may test your programs with different test cases and your final grade may be different from what you saw on GradeChecker/CodeRunner.

Submit your take-home exam via SUCourse ONLY! GradeChecker is not considered as a submission. Any other methods (paper, email, etc.) are not acceptable, either.

The internal clock of SUCourse might be a couple of minutes skewed, so make sure you do not leave the submission to the last minute. Do not forget that "*No successful submission on SUCourse on time = a grade of 0 directly for that take-home exam.*"

Plagiarism Policy (Academic Integrity)

Although we encourage the students to work and study together; midterm/final exams, take-home exams and quizzes are expected to be students' own works. Students need to understand the **difference between helping and cheating**. You may share your ideas and knowledge, but you should not (and never) share your script or code. Allowing friends to copy part of an exam or an assignment from your work is not helping. In such a case, both parties will be considered as submitting a plagiarised work, and ***such behaviour will have disciplinary consequences for all parties involved***. Additionally, it is the student's responsibility to make sure that the assignment in question is never in publicly accessible locations.

If the submitted assignment (*take-home exam*) is not done by the student himself/herself, then (s)he will get **-100** from that particular assignment. If a student repeats it again, then (s)he will **fail the class**. On the other hand, ***if the submitted work is for quiz/midterm/final, then the student will directly fail the course***, even if the plagiarism is only for a single question or even a single part of a single question. No exceptions will be made to this rule.

It is the student's responsibility to ensure that (s)he completely understands any material that (s)he submits and that (s)he is actively engaged in the production of the solution. The instructors and TAs of this course reserve the right to ask the students to explain the reasoning behind their work without the presence of any collaborators ***at any time***. The students should know that the ***written submitted work is not the only material that will be graded***. The instructors or TAs might ***request a viva*** (oral exam), and ***grade it instead of the written submitted work***.

Additionally, cases of plagiarism will be directly referred to the Dean's Office for disciplinary action. This course does not tolerate any breach of academic integrity (more info [here](#)).

Please also see the [Plagiarism Policy document](#) shared via SUCourse.

Additional Notes

Students are responsible for every announcement made in lecture/SUCourse or sent via email. Students are expected to check their Sabanci University mail inboxes regularly as important announcements will be sent to them via email. Not attending the class, not following SUCourse, not checking emails regularly is not an excuse, in case they miss something.

Expectations from Students

- ❖ Students are expected to attend all classes, recitations and labs. In CS204 you will continue to learn a programming language and it is much easier to learn a programming language when a person explains it. You have to spend more time to compensate for a missed class. So absenteeism does not buy time.
- ❖ Students are responsible for the material covered in class even if it is not part of the lecture notes published on SUCourse (sometimes we explain some stuff on the board). That is why attendance is important.
- ❖ Students are responsible to check their emails (Sabanci University accounts) and SUCourse daily for any announcements related to this course.
- ❖ You must attend the synchronous Zoom lectures, recitations, etc. and real-time online exams with your SU email account.

**See SUCourse for other information,
but this is important:**

**Plagiarism, Cheating and Exam Trading
will NOT be tolerated!**