CSCI 2312: Object-Oriented Programming
Department of Computer Science and Engineering
College of Engineering, Design, and Computing
University of Colorado Denver
Fall 2023

Instructor Information

Section 001	
Instructor: Javier Pastorino (website)	**Class Meeting Days**: Monday & Wednesday
Email: javier.pastorino@ucdenver.edu	**Class Meeting Hours**: 11 am – 12:15 pm
Phone: 303-315-1408	**Classroom Location**: TBA
Office: LW 320-E	**TA**: TBA

Office Hours: times posted on Canvas. Appointments are required. Schedule through Calendly.

Section 002	
Instructor: Diane Ricciardella	**Class Meeting Days**: Tuesday & Thursday
Email: diane.ricciardella@ucdenver.edu	**Class Meeting Hours**: 9:30 – 10:45 am
Phone: 303-315-1408	**Classroom Location**: TBA
Office: LW-829	**TA**: TBA

Office Hours: Times posted on Canvas. Appointment may be required. Schedule via email or Calendly

Section 003	
Instructor: Diane Ricciardella	**Class Meeting Days**: Tuesday & Thursday
Email: diane.ricciardella@ucdenver.edu	**Class Meeting Hours**: 11 am – 12:15 pm
Phone: 303-315-1408	**Classroom Location**: TBA
Office: LW-829	**TA**: TBA

Office Hours: Times posted on Canvas. Appointment may be required. Schedule via email or Calendly

Course Coordinator
Instructor: Javier Pastorino (website)

Email: javier.pastorino@ucdenver.edu

Phone: 303-315-1408

Office: LW 320-E

Office Hours: Schedule an appointment through Calendly.

General Information

Catalog Description

Programming topics in the C++ language. The emphasis is on problem-solving using object-oriented and Generic Programming. Topics include advanced I/O, classes, inheritance, polymorphism and virtual functions, abstract base classes, exception handling, templates, and the Standard Template Library. It is a Required course.

Course Objectives

To use C++ to facilitate the effective use of significant aspects of object-oriented modeling and programming, exception handling, and memory management.

1. Be familiar with the building blocks of a computer.

2. Be familiar with the concepts and components of an Object-Oriented Language (C++)

3. Create a program/application that successfully meets provided specifications.

4. Understand the concepts of Top-down programming.

5. Be able to troubleshoot a C++ program.

6. Use exception handling correctly

7. Understand the concepts of memory management

Course Format

This course will be conducted in person with two 75-minute sessions each week.

Prerequisites and Co-requisites

Prerequisites: This course requires **CSCI-1410** and **CSCI-1411** with a grade of **C-** or higher.
Co-requisites: None
Note: Each student must sign the online Prerequisite Agreement form to receive credit for the course. If this form is not completed by 5:00 pm on Friday of week 1, the student will be administratively dropped from the course. *The form is linked on Canvas.*

Learning Outcomes

Expected Knowledge at the Start of the Course:

Understanding the general concept of programming covering the topics of identifiers, variables, data types, expressions, assignments, conditional and loop constructs, containers, classes, and objects.

Expected Knowledge Gained at the End of the Course:

Students are expected to understand C++ programming language and use it to facilitate the effective use of significant aspects of object-oriented modeling and programming, including:
- the basic syntax and language constructs of C++ programming languages,
- the concepts and principles of the four pillars of the Object-Oriented paradigm,

- the usage of C++ language to develop complete OO programs to provide software solutions,
- applying the OOP principles,
- exception handling in C++,

ABET Assessment Criteria

The ABET outcome item assessed in this course is *Criteria 2: Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline*.

Textbook

C++ How to Program by P. Deitel and H. Deitel. 10th Edition. Published by Pearson. ISBN 978-0-13-444823-7. *(required).*

Topics

- Introduction to C++, variables, data types, input/output.
- Object Oriented Programming (OOP) concepts. UML.
- Algorithm Development and Control Structures.
- Functions and Recursion.
- Exception Handling
- Dynamic Memory and C++ pointers.
- Classes. Operator Overloading. Inheritance and Polymorphism. Virtual functions.
- Stream Input/Output. File Processing.
- Standard Library.

Course Schedule

The following schedule is tentative. However, we will try to adhere to it as much as possible.

Tentative Class Schedule for CSCI 2312 - Fall 2023

Week #		Topic to be Covered		Readings	Assessments
1	Aug-21 - Aug-23	Course Intro. and GitHub Platforms. Basis of Computing. Introduction to C++.		1, 2	
2	Aug-28 - Aug-30	Introduction to Objects and Classes		3	Hwk 1 Due
3	Sep-04 - Sep-06	Algorithm Development - Control Structures I. (*Labor Day Mon - no class*)		4	Hwk 2 Due
4	Sep-11 - Sep-13	Control Structures II - Logical Operators		5	Hwk 3 Due
5	Sep-18 - Sep-20	Functions and Recursion		6	Hwk 4 due
6	Sep-25 - Sep-27	Classes `array` and `vector`. Intro to Exception Handling .		7	Hwk 5 Due
7	Oct-02 - Oct-04	Dynamic Memory: Pointers		8	Hwk 6 Due
8	Oct-09 - Oct-11	Classes - A deeper look.	**Midterm on Friday 12-2p.** Ch 1-8	9	**Midterm**
9	Oct-16 - Oct-18	Operator Overloading. Class `String`		10	Hwk 7 Due
10	Oct-23 - Oct-25	Inheritance		11	Hwk 8 Due
11	Oct-30 - Nov-01	Polymorphism		12	Hwk 9 Due
12	Nov-06 - Nov-08	Stream Input/Output		13	Hwk 10 Due
13	Nov-13 - Nov-15	File Processing		14	Hwk 11 Due
14	Nov-20 - Nov-22	**Fall Break - No Class**			
15	Nov-27 - Nov-29	Standard Library: Containers and Iterators		15	Hwk 12 Due
16	Dec-04 - Dec-06	A deep look at Strings, C-String, and Structs	**Final Exam on Friday 12-2p.** Ch 9-14	21, 22	**Final Exam**
17	Dec-11 - Dec-13	**No Class Period during Finals Week**			

Assigned readings **must** be completed before the lecture.

Grading Policies

Grades will be recorded on Canvas. You can check on Canvas for all your current grades. After grades are posted on Canvas, you will have <u>one week to meet with the instructor/TA</u> to clarify any corrections or incorrect grades. <u>After that week, no changes will be made.</u>

Course grades are a weighted average of the grades earned on all graded material. The weights for the different categories are:

Project	20%
Homework	30%
Midterm Exam	25%
Final Exam	25%

Letter grades will be assigned as follows:

0	F	60	61	D-	63	64	D	66	67	D+	69	70	C-	73	74	C	76	77	C+	79	80	B-	83	84	B	86	87	B+	89	90	A-	93	94	A	100

This course will have the following assessments:

- **Homework**: This consists of programming assignments to be implemented in C++.

    o Homework assignments measure ABET Criteria 2.

    o Homework assignments are individual assessments that provide practice and assess the student's understanding of the topics.

    o Homework will be implemented using GitHub Codespace, and it will be submitted through GitHub Classroom.

    o The grading of homework is a combination of completeness and correctness of the outputs and programming style. Completeness and correctness (80% of the grade) will be assessed automatically through automatic testing on GitHub Classroom, while instructors and TA will assess the programming style (20% of the grade).

        ▪ With automatic testing, students will receive immediate feedback. During the assessment period, students can fix any existing problem, request help from TA and instructors, as well as resubmit as often as needed (prior to the due date), to achieve full credit. Starting homework early will be crucial for students to perform well on the homework.

    o Late submissions can be granted upon request but are subject to grade penalties.

    o A GitHub account is needed, and it can be claimed for free with the GitHub Educational Backpack program.

- **Exams**: There are two exams: a midterm and a final (comprehensive) exam. Exams measure ABET criteria 2.

- **Final Project:** There will be a final project worth 20% of the grade.

- **Attendance**: Attendance is required for this course. As with all computer science courses, you will learn the material easier if you attend the lectures and participate in class. **Four or more absences will result in a 10% grade reduction.**

Course Procedures

Incomplete Grade: An Incomplete Grade is rarely given. There must be extreme extenuating circumstances that are well documented. The current university policy concerning incomplete grades will be followed in this course. A grade of Incomplete will only be considered when unexpected emergencies prevent a student from completing the course. Unfinished work must be finished by the agreed-upon date, or the "I" will automatically be recorded as an "F" on your transcript.

Canvas: We will be using Canvas in this course to assign all the coursework, communicate class-wide announcements, and record grades. So, you should check it frequently.

Individual Communication: Students should rely **only on the University email system** (Outlook) to communicate with the instructors. If you need to contact us, please **email us**. Do NOT use Canvas messages. Your instructor's email is listed at the beginning of this document. Include `CSCI-2312` in the subject line for a quicker response (usually within 24-48 hours on weekdays). However, to discuss exercises/problems, please schedule an appointment with your instructor (see office hours on the first page); we usually cannot answer those questions over email.

Course Coordinator: The course coordinator is listed on the first page. Students are encouraged to discuss issues that arise during the semester with their instructor. In most cases, issues can be resolved easily with direct conversations between students and instructors. If a problem arises where a student does not feel comfortable talking with their instructor or if a student still has concerns after speaking with their instructor, then students are encouraged to reach out to the course coordinator. Students should bring concrete examples of their concerns when meeting with the course coordinator to aid the discussions.

Student Expectations

Civility: Our commitment is to create a climate for learning characterized by respect for each other and each person's contributions to the class. We ask for a similar commitment from our students.

Professionalism: Since mobile devices can be a distraction during class, I ask that all devices be put into "silent" mode and not utilized during class; this includes checking Facebook, sending a Tweet, or checking email. If the instructor feels your mobile device distracts other students, you, or the instructor themselves, you will be asked to leave the classroom.

Religious Observations: We understand that an individual's religion plays a large part in their life, and we want this course to interfere with those as little as possible. If you find that your religion's holiday(s) falls on a class day and you cannot attend due to this, **please email the instructor two weeks in advance of the holiday's date**. We will work together to try to accommodate; however, note that this accommodation may not be possible in some cases, like on exams.

Collaboration and Cheating

We encourage you to review material and discuss ideas with other students, and work on problems you encounter. Discussions often help clarify problems and resolve difficulties — feel free to take advantage of this to improve your understanding of the material, but make sure you **create your own work**. It's vital that you go through the program design, coding, and debugging processes yourself, or you will not be developing your programming skills and understanding.

AI-generated solutions should be documented appropriately, showing what you used from a tool and how the student correctly extended that. Failing to do so will be considered cheating (not the student's work). Please, meet with your instructor before using any of these tools to discuss how you plan to use them.

AI tools, like ChatGPT and others, are **not allowed** in this course. Students should check the restrictions for each assessment and contact the instructor if they need clarification. We reserve the right to use automated similarity metrics to detect plagiarism in this course.

<p align="center"><b style="color:red">All students must create their work on their own!</p>

Any instances of cheating will result in a zero for the assignment, a grade of zero (an "F") in the course, or sanctions determined by the college (including suspension and expulsion).

Sharing solutions (whole or partial) is not allowed and is considered plagiarism. Using somebody else's solution as your own is also considered plagiarism. This includes taking someone else's solution with or without their permission or asking a third party (like a tutor) for the answer.

If you need help, visit your instructor's or TA's office hours.

All students must adhere to the [College of Engineering, Design, and Computing - Student Honor Code](#).

University Policies

Access: The University of Colorado Denver is committed to providing reasonable accommodation and access to programs and services to persons with disabilities. Students with disabilities who want academic accommodations must register with Disability Resources and Services (DRS) in Student Commons Building, Suite 2116, Phone: 303-315-3510, TTY: 303-556-4766, Fax: 303-315-5315. I will be happy to provide approved accommodations once you provide me with a copy of DRS's letter. DRS requires students to provide current and adequate documentation of their disabilities. Once a student has registered with DRS, DRS will review the documentation and assess the student's request for academic accommodations in light of the documentation. DRS will then provide the student with a letter indicating which academic accommodations have been approved.

Academic Honesty and Student Code of Conduct: Students are expected to know, understand, and comply with the ethical standards of the university and the college, including rules against plagiarism, cheating, fabrication and falsification, multiple submissions, misuse of academic materials, and complicity in academic dishonesty. For more information on Academic Honesty and the Student Code of Conduct, please see:

https://www.ucdenver.edu/student/health-wellness/student-conduct

Mental Health Resources:

CU Denver faculty and staff understand the stress and pressure of college life. Students experiencing symptoms of anxiety, depression, substance use, loneliness or other issues affecting their mental well-being, have access to campus support services such as the Student and Community Counseling Center, the Wellness Center, and the Office of Case Management. Students also have access to the You@CUDenver on-line well-being platform available 24/7. More information about mental health education and resources can be found at Lynx Central and CU Denver's Health & Wellness page. Students in imminent crisis can contact Colorado Crisis Services for immediate assistance 24/7 or walk-in to the counseling center during regular business hours.

Last updated on August 11, 2023.