

# CSCI 2312: Object Oriented Programming

## Department of Computer Science and Engineering

### Course Syllabus – Fall, 2022

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<b>Instructor:</b>	Javier Pastorino ( <a href="#">website</a> )	<b>Class Days:</b>	Mon & Wed
<b>Email:</b>	<a href="mailto:javier.pastorino@ucdenver.edu">javier.pastorino@ucdenver.edu</a>	<b>Class Times:</b>	11am – 12:15pm
<b>Office:</b>	LSC 320-E	<b>Classroom:</b>	LSC 844
<b>Office Hours:</b>	Tuesdays. Schedule appointment on <a href="#">Calendly</a> .		

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## Course Description

### Catalog Data

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.

### Course Objectives

To use C++ to facilitate effective use of major aspects of object-oriented modeling and programming including exception handling

### Course Format

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

### Prerequisites

This course requires **CSCI1410** and **CSCI1411** with a grade of **C-** or higher.

*Each student must sign the [Prerequisites Agreement Form](#) and [take the non-graded prerequisite assessment](#) to receive credit for any assessment. If this is not completed by Friday 5pm on the first week, the student will be administratively dropped from the course.*

**Prerequisites Agreement form and assessment will be available on Canvas.**

### Co-requisites

This course has no co-requisites.

## Learning Outcomes

### Expected Knowledge at the Start of the Course:

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

### Expected Knowledge Gained at the end of the Course:

Students are expected to understand C++ programming language and use it to facilitate effective use of major aspects of object-oriented modeling and programming including:

- the basic syntax and language constructs of C++ programming languages,

- the concepts and principles of four pillars of 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++,
- developing programs in various development environments and platforms including the CSE grid server and REPLit on-line platforms.

#### **ABET Assessment Criteria**

(i) Ability to use current techniques, skills, and tools necessary for computing practice.

### **Textbooks & Tools**

The course will require the following textbook:

- **Absolute C++**, 6<sup>th</sup> Edition. Walter Savitch. Pearson. ISBN 13: 978-0-1-3397098-2.  
**(Required)**

Additional readings, for deepening knowledge, may be announced during the course.

#### **Required Tools**

- A computer with a minimum of 8GB of RAM (16G recommended).
- You can use Windows, MacOS or Linux operating systems.
- Computer Labs can also be used. Credentials to access CSE Grid are required.
- A JetBrains educational account (free) will be required to download IDE.

### **Topics**

- Introduction to C++, variables, data types, input/output.
- Flow control in C++.
- Functions, function overload.
- Arrays, Strings, Streams, and File I/O.
- Object Oriented Programming (OOP) concepts. UML.
- Structures and Classes. Inheritance and Polymorphism. Virtual functions.
- C++ Pointers and dynamic memory.
- Exception handling.
- Template Class and STL.

## Course Schedule:

Week	Date	Topic	Readings	Homework
#1	Mon, Aug 22	Course Introduction		
	Wed, Aug 24	Introduction to C++		
#2	Mon, Aug 29	First App. Variables, Data Types, Expression, cin/cout	Ch 1	
	Wed, Aug 31	Flow Control	Ch 2	
#3	Mon, Sep 05	Labor Day - No classes		
	Wed, Sep 07	Functions Basis	Ch 3	Hwk 1 Due
#4	Mon, Sep 12	Functions Basis	Ch 3	
	Wed, Sep 14	Parameters & Overloading	Ch 4	
#5	Mon, Sep 19	Arrays	Ch 5	Hwk 2 Due
	Wed, Sep 21	Strings	Ch 9	
#6	Mon, Sep 26	Streams and File I/O	Ch 12	
	Wed, Sep 28	OOP Concepts / UML	Add. Material	
#7	Mon, Oct 03	Structures and Classes	Ch 6	Hwk 3 Due
	Wed, Oct 05	Structures and Classes	Ch 6	
#8	Mon, Oct 10	Constructors	Ch 7	
	Wed, Oct 12	Exam Review		
#9	Mon, Oct 17	Midterm Exam		
	Wed, Oct 19	Pointers & Dynamic Arrays	Ch 10	
#10	Mon, Oct 24	Separate Compilations	Ch 11	Hwk 4 Due
	Wed, Oct 26	Inheritance	Ch 14	
#11	Mon, Oct 31	Polymorphism	Ch 15	
	Wed, Nov 02	Polymorphism	Ch 15	
#12	Mon, Nov 07	Virtual Functions	Ch 15	Hwk 5 Due
	Wed, Nov 09	Operator Overloading, Friend Function, References	Ch 8	
#13	Mon, Nov 14	Exception Handling	Ch 18	
	Wed, Nov 16	Exception Handling	Ch 18	
#14	Mon, Nov 21	Fall Break		
	Wed, Nov 23	Fall Break		
#15	Mon, Nov 28	Templates	Ch 16	Hwk 6 Due
	Wed, Nov 30	STL	Ch 19	
#16	Mon, Dec 05	Software Design Patterns and OOP in Java & Python		
	Wed, Dec 07	Final Exam Review		Hwk 7 Due
Finals	Mon, Dec 12	Final Exam (TBD)		
	Wed, Dec 14	Final Exam (TBD)		

The previous schedule is tentative, and it may change. Please, check the current one on Canvas.

## Assessments

There will be four types of assessments in this course.

- **Homework:** This consists of programming assignments to be implemented in C++.
  - Homework will be submitted on Canvas.
  - The grading of homework is a combination of completeness (all specifications are covered), correctness of results, and style.
  - All homework due at 11:59 PM on the due date.
  - Late submissions can be granted upon request but are subject to grade penalties. Late submissions of up to one week receives a maximum of 80% (with documented attenuating circumstances) or up to 50% max; no homework will be accepted more than one week late.

- **Exams:** There are two exams. A midterm and a final (comprehensive) exam.
- **Attendance:** Attendance is required for this course. As with all science courses, you will have an easier time learning the material if you attend the lectures and participate in class.

## Grading Policy

- Assignment due date will be posted on Canvas.
- Grades will be posted on Canvas.
- The Final Grade will be distributed among the assessments following the table below.

Assessment Group	Grade
Homework	45%
Midterm exam	25%
Final exam (comprehensive)	25%
Attendance	5%

- Final Letter Grade will be converted using the following scale:

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
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- **Grades of “Incomplete”:** The current university policy concerning incomplete grades will be followed in this course. Incomplete grades are given only in situations where unexpected emergencies prevent a student from completing the course and the remaining work can be completed the next semester. Your instructor is the final authority on whether you qualify for an incomplete.

## Communications

Class wide announcements will be posted on Canvas announcements. Make sure you have configured the notifications not to miss those. You can set email notifications or use the Canvas app in your mobile device with push notifications.

If you need to contact me, please **use email**, do not use Canvas messages (I don’t read those). I usually reply to emails within 24-48 hours. My email is listed at the beginning of this document. Include **CSCI2312** in your subject line for a quick response. However, to discuss exercises/problems, please schedule an appointment during my office hours, as I will usually not be able to answer those questions over email.

## Code of Conduct

### Student expectations

- **Civility:** Our commitment is to create a climate for learning characterized by respect for each other and the contributions each person makes to class. Student should follow the same commitment.
- **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 include any notifications that you have in your devices while on a remote session.

- **Classroom Devices:** Out of respect for everyone in the classroom, if you would like to record the lectures you must first receive my approval. I generally will approve the request, but I first would like to speak with you concerning the scope of the recording. Otherwise, all electronic devices like cellphones or tables, should be put away during class, unless actively used for class-related activities.

### Collaboration and Cheating

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

If you have any questions about what this means, please see me.

We reserve the right to use automated similarity metrics to detect plagiarism in this course.

### **All students must create their work on their own!**

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) it is not allowed, and it 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 solution. If you need help come to your instructor's or TA's office hours.

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

### **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 July 27, 2022.*