





Object-Oriented Data Structures in C++

University of Illinois at Urbana-Champaign

About this Course

This course teaches learners how to write a program in the C++ language, including how to set up a development environment for writing and debugging C++ code and how to implement data structures as C++ classes. It is the first course in the Accelerated CS Fundamentals specialization, and subsequent courses in this specialization will be using C++ as the language for implementing the data structures covered in class.



Taught by: Wade Fagen-Ulmschneider, Teaching Assistant Professor
Computer Science

Basic Info	Course 1 of 3 in the Accelerated Computer Science Fundamentals Specialization
Level	Intermediate
Commitment	4 weeks of study, 6-9 hours per week
Language	English Volunteer to translate subtitles for this course
How To Pass	Pass all graded assignments to complete the course.
User Ratings	★ ★ ★ ★ 4.9 stars

Syllabus



Orientation; Writing a C++ Program

- 5 videos, 13 readings
 - 1. Video: Introduction to Object-Oriented Data Structures in C++!
 - 2. Reading: Syllabus
 - 3. Reading: Additional References for C++
 - 4. Reading: About the Discussion Forums
 - 5. Reading: Updating Your Profile
 - 6. **Discussion Prompt:** Getting to Know Your Classmates
 - 7. Reading: Week 1 Overview
 - 8. Video: 1.0 Week 1 Overview
 - 9. Video: 1.1 C++ Introduction
 - 10. Reading: Installing a C++ Code Editor on Your Own Computer
 - 11. Reading: Choosing a Linux-Compatible Environment and Compiler for C++
 - 12. **Reading:** Signing Up to Use the AWS Cloud9 Service
 - 13. **Reading:** Creating a Cloud9 Environment on AWS
 - 14. LTI Item: Bonus: Redeem Extra AWS Starter Credit
 - 15. Reading: Note: Common Cloud9 Issues
 - 16. **Reading:** Downloading the Example C++ Source Code for Lecture with Git
 - 17. Video: 1.2 C++ Classes
 - 18. Video: 1.3 C++'s Standard Library (std)
 - 19. **Reading:** Important Tips and Notes for All Challenge Problems
 - 20. Reading: Preparing for the Week 2 Project

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- Graded: Orientation Quiz
- (2) **Graded:** Week 1 Quiz
- Graded: Week 1 Challenge

__WEEK 2



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Understanding the C++ Memory Model

- 4 videos, 7 readings
 - 1. Reading: Week 2 Overview
 - 2. Video: Week 2 Introduction
 - 3. Video: 2.1 Stack Memory and Pointers
 - 4. Video: 2.2 Heap Memory
 - 5. Video: 2.3 Heap Memory Puzzles
 - 6. Reading: C++ Syntax Notes: Making Comments in C++ Code
 - 7. Reading: Headers and Source Files: C++ Code Organization
 - 8. **Reading:** Compiling and Running a C++ Program
 - 9. Reading: (Optional) Useful Bash Terminal Commands
 - 10. Reading: C++ Syntax Notes: Basic Operators, If-Else, and Type Casting
 - 11. Reading: C++ Syntax Notes: Block Scope, Loops

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- (2) Graded: Week 2 Quiz
- (2) **Graded:** Week 2 Challenge
- (2) **Graded:** Hello World Project

WEEK 3

Developing C++ Classes

- 6 videos, 5 readings
 - 1. Reading: Week 3 Overview
 - 2. Video: Week 3 Introduction
 - 3. Video: 3.1 Class Constructors

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4. Video: 3.2 Copy Constructors

5. Video: 3.3 Copy Assignment Operator

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6. Video: 3.4 Variable Storage

- 7. Video: 3.5 Class Destructor
- 8. Reading: C++ Syntax Notes: Uninitialized Pointers, Segfaults, and Undefined Behavior
- 9. Reading: C++ Syntax Notes: The modern range-based for loop
- 10. Reading: (Optional) Unsigned Integers
- 11. Reading: Preparing for the Week 4 Project

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- (2) **Graded:** Week 3 Quiz
- (2) **Graded:** Week 3 Challenge

WEEK 4

Engineering C++ Software Solutions

- 7 videos, 1 reading
 - 1. Reading: Week 4 Overview
 - 2. Video: Week 4 Introduction
 - 3. Video: 4.1 Template Types
 - 4. Video: 4.2 Tower of Hanoi Introduction
 - 5. Video: 4.3 Tower of Hanoi Solution 1
 - 6. Video: 4.4 Tower of Hanoi Solution 2
 - 7. Video: 4.5 Templates and Classes
 - 8. Video: 4.6 Inheritance
 - 9. LTI Item: Bonus: Redeem Extra AWS Completion Credit

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- (2) **Graded:** Week 4 Quiz
- (2) **Graded:** Week 4 Challenge



Graded: Image Transform Project



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How It Works

GENERAL

How do I pass the course?

To earn your Course Certificate, you'll need to earn a passing grade on each of the required assignments—these can be quizzes, peer-graded assignments, or programming assignments. Videos, readings, and practice exercises are there to help you prepare for the graded assignments.

What do start dates and end dates mean?

PROGRAMMINIGNASSIGNMENTS to all videos, readings, quizzes, and programming assignments (if applicable). If you choose to explore the course without purchasing, you may not be able to access Frogramming assignments require you to write and run a computer program to solve, you can reset your deadlines. Your progress will be saved and you'll be able to pick up where you left off.

What are due dates? Is there a penalty for submitting my work after a due date? What are programming assignments?

Millipra course, there are suggested due dates to help you manage your schedule and keep ructions. roay sayode farmatiling and Autorguide at the following state of the content of t consequence. However, it is possible that you map to receive a grade if you submit your peer-graded and other resources. Assignment parts are similar to receive a grade if you submit your peer-graded assignment to the because classification at a time.

How are programming assignments graded? Datastructures and Alassianment?c++

Leamoguandaminegtadsigfinoembuaee grædeed aultibenietipleliftlingyelfseenbulattansalgotühesniyoCull-see your Yeadl within seconos. If the your grade, you can always try again, if you're retattempting a peergraded assignment, re-submit your work as soon as you can to make sure there's enough time for estimates to review your work in some cases you may need to wait before re-submitting a programming assignoeterated Computerageign co Femelamenseals terial during this delay. You can resubmit രിപ്പാള്ള്യുക്നുന്നിനുള്ള ക്രെള്ളുക്കുള്ളൂനുള്ളൂർ പ്രവാധ your grade. Follow the same steps as ing a new assignment.

What do I do if I have trouble submitting my assignment?

View the course in catalog

If you have trouble submitting your assignment, we encourage you to visit your course Discussion Forums as many of your peers are likely to have had similar problems and have found a solution. Each programming assignment has its own sub-forum to discuss with peers.



Related Courses







Data Analysis and Representation, Selection and Iteration

University of Colorado System



Abstraction, Problem Decomposition, and Functions
University of Colorado System



Simulation, Algorithm Analysis, and Pointers University of Colorado System



Algorithms, Data Collection, and Starting to Code University of Colorado System



Unordered Data Structures

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