Computer Science (COMP) 306

C++ for Programmers (Revision 4)

Status:	Replaced with new revision, see the **course listing** for the current revision
Delivery mode:	**Individualized study online**. Delivered via Brightspace.
Credits:	3
Area of study:	Science
Prerequisites:	Prior computer programming training and/or experience in a third-generation language such as C or Java and Professor approval is required.
Precluded:	COMP 206, COMP 307 and COMP 389. (COMP 306 cannot be taken for credit if credit has already been obtained for COMP 206, COMP 307 or

	COMP 389.)
Challenge:	COMP 306 is not available for challenge.
Faculty:	**Faculty of Science and Technology**
Notes:	Students who are concerned about not meeting the prerequisites for this course are encouraged to contact the **Course Professor** before registering.

Overview

COMP 306 is designed to extend students' knowledge and practice in programming in C++. The course progresses from first principles to advanced topics in object-oriented programming using C++. To be able to complete this course, students should have prior programming experience in a third-generation language such as C or Java, and solid programming skills in that language.

Outline

There are 20 units in this course, each of which teaches new programming skills and builds upon previous ones. Units 1–15 are introductory material and can be reviewed quickly. Advanced topics in

the course are covered in Units 16–20.

Learning outcomes

Upon successful completion of the course, you should be able to

- outline the essential features and elements of the C++ programming language.
- explain programming fundamentals, including statement and control flow and recursion.
- articulate the principles of object-oriented problem solving and programming.
- apply the concepts of class, method, constructor, instance, data abstraction, function abstraction, inheritance, overriding, overloading and polymorphism.
- program with basic data structures using array, vector, and other structures.
- program using objects and data abstraction, class, and methods in function abstraction.
- program using advanced topics, including exceptions, templates and the Standard Template Library.
- analyze, write, debug and test basic C++ codes using the approaches introduced in the course.
- analyze problems and implement simple C++ applications using an object-oriented approach.

Evaluation

To **receive credit** for COMP 306, you must achieve a course composite grade of at least **D (50 percent)**, including a grade of 50 percent on each assignment, at least 50 percent on the final examination. The weighting of the composite grade is as follows:

Activity	Weight
Assignment 1	15%
Assignment 2	20%
Assignment 3	20%
Assignment 4	30%
Final Examination	15%
Total	**100%**

The **final examination** for this course must be requested in advance and written under the supervision of an AU-approved exam invigilator. Invigilators include either ProctorU or an approved in-person invigilation centre that can accommodate online exams. Students are responsible for payment of any invigilation fees. Information on exam request deadlines, invigilators, and other exam-related questions, can be found at the **Exams and grades** section of the Calendar.

Materials

This course either does not have a course package or the textbooks are open-source material and available to students at no cost. This course has a **Course Administration and Technology Fee** ,

but students are not charged the Course Materials Fee.

Digital course materials

Links to the following course materials will be made available in the course:

Downey, A. B. (1999). *Think C++* (version 1.1.0).

Brokken, F. B. (2022). *C++ annotations* (version 12.2.0).

Busbee, K. L. (2013). *Programming fundamentals — A modular structured approach using C++* (version 1.22).

Hansen, J. A. (2013, November). *The rook's guide to C++* (version 1.0).

The textbooks for this course are Open Educational Resources (OER).

Important links

- **Academic advising**
- **Program planning**
- **Request assistance**
- **Support services at AU**

Athabasca University reserves the right to amend course outlines occasionally and without notice. Courses offered by other delivery modes may vary from their individualized study counterparts.

Opened in Revision 4, September 18, 2024

Updated November 26, 2026

View **previous revision**