COLLEGE OF
THE ROCKIES

COMP-105 – Introduction to Programming in the C and C++ Language

University Arts and Science

Effective Term & Year: Fall 2022
Course Outline Review Date: 2025-04-01

Program Area: Math and Sciences

Description:

Covers the basic programming techniques of C and C++ languages with an introduction to structured programming and abstract data types.

Program Information:

This course is an important foundation of many science programs including Physics, Chemistry, Mathematics, Computing Science, Engineering, and Astronomy.

Delivery Methods: On-campus (Face-to-Face)

Credit Type: College of the Rockies Credits

Credits: 3

Course type/s: Sciences

Instructional Activity and Hours:

Activity	Hours
Classroom, Directed Studies or Online Instruction	45
Seminar/Tutorials	
Laboratory/Studio	45
Practicum/Field Experience	
Co-op/Work Experience	
Other	

Total	90

Course Requisites:

- Complete all of the following
    - Earned a minimum grade of C+ (65%) in at least 1 of the following:
        - MATH090 – Mathematics – Provincial Level
        - FOM 12 – Foundations of Mathematics 12
        - PREC 12 – Pre-Calculus 12
    - It is recommended that students have programmed in some programming language before.
    - Complete 1 of the following
        - Completed or concurrently enrolled in:
            - MATH103 – Differential Calculus (3)
            - MATH104 – Integral Calculus (3)
        - Completed or concurrently enrolled in:
            - MATH101 – Finite Mathematics 1 (3)
            - MATH102 – Introduction to Discrete Mathematics (3)

Flexible Assessment: Yes

In some cases students may be able to apply for recognition of prior learning outside the classroom. This flexible assessment process provides equivalent course credit. It is a rigorous process that may include external evaluation, worksite assessment, demonstration, standardized test, self-assessment, interview, products/portfolio, and challenge exam, or other measures as appropriate. Tuition fees apply. Contact an education advisor for more information.

Course Transfer Credit:

For information about receiving transfer credit for courses taken at other BC institutions, please see http://www.bctransferguide.ca. All requests for course transfer credit from institutions in BC or elsewhere should go to the College of the Rockies Enrollment Services office.

Textbook Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use:

C++ Primer Plus, Stephen Prata, 6th edition, Pearson.

Please see the instructor's syllabus or check COTR's online text calculator
https://textbook.cotr.bc.ca/ for a complete list of the currently required textbooks.

Learning Outcomes:

Upon the successful completion of this course, students will be able to:

- understand the relationship between programming, hardware, and software;
- understand how computer language affects the operation of a computer;
- read, write, and debug C and C++ code;
- utilize top down computer programming, that is to break down a complex project into smaller, manageable subroutines for either individual or group work (demonstrate analytical thinking);
- apply good programming style;
- assemble small modules into a smoothly operating larger program, that is efficient, quick, user friendly, and easy to improve / repair (demonstrate synthetic thinking);
- conceive of a project, plan it, develop it, exercise quality control over it, document it, and see it to conclusion before a fixed deadline;
- incorporate social and group management skills in the development of a programming project as part of a group;
- apply mathematical knowledge to the design and implementation of computer algorithms;
- write programs to accomplish simple tasks;
- develop and maintain a computer programming portfolio, and a system of libraries and useful subroutines ;
- recognize and evaluate the wide variety of careers in the computer industry; and
- use programming skills to assist on entry level projects in the work place.

This course should help students with:

- **interpersonal skills** ? most commercial software development is done in large teams. A successful student should be able to work in groups more effectively.
- **project management** ? you will have managed a project from conception to final polished submission by course end.
- **professional communication** – through documentation and explanations to others you will be learning clear, simple, and concise communication.
- **research skills** — will be enhanced by the search, editing, and adaptation of various algorithmic approaches to programming problems.
- **personal and professional skills** — will increase as you meet fixed deadlines, work under pressure, plan in detail, and finish and polish projects.

Course Topics:

- **Introduction :**

introduction to computer hardware, software, and career opportunities

- **Using the integrated development environment**

- **The C Language:**

Specific syntax and limitations including data types, statements, operators, control structures, functions, arrays, pointers, strings, recursion

- **The Data Structures:**

developing structures; techniques for adding, deleting, and editing records; dynamic memory allocation and deletion; search and sorting algorithms; lists, linked lists, queues, stacks, indexing, and trees; input and output techniques; reports

See instructor's syllabus for the detailed outline of weekly readings, activities and assignments.

Evaluation and Assessments

Assessment Type: On-Campus (face-to-face)

Assessment Type	% of Total Grade
Assignments	10%
Project: Open	20%
Lab Exams	45%
Final Exam	25%
Total	100%

Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	<50

Pass requirements: None

Evaluation Notes: A grade of "D" grants credit, but may not be sufficient as a prerequisite for sequential courses.

Exam Attendance:

Students must attend all scheduled exams at the appointed time and place. Instructors may approve an alternate exam to accommodate an illness or personal crisis. Department heads will consider other written requests. Any student who misses a scheduled exam without prior approval will receive a "0" on the exam.

Academic Policies:

College of the Rockies policies related to courses can be found at
https://cotr.bc.ca/about-us/college-policies/ and include the following:

- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Conduct (plagiarism, other cheating, behavioral misconduct)
- Policy 2.5.8 Academic Performance
- Policy 2.5.3 Grade Appeal
- Policy 2.4.9 Student Concerns Re Faculty

Course Changes:

The College of the Rockies updates course outlines regularly to meet changing educational, employment and marketing needs. The instructor will notify students in writing of any updates to this outline during the semester. The instructor reserves the right to revise, add or delete material while meeting the learning outcomes of this course outline.