COLLEGE OF THE ROCKIES

Introduction to Programming in the C and C++ Language – CSCI 105

University Studies Program

Course Outline

COURSE IMPLEMENTATION DATE:	**Pre 1998**
OUTLINE EFFECTIVE DATE:	**September 2023**
COURSE OUTLINE REVIEW DATE:	**April 2028**

GENERAL COURSE DESCRIPTION:

This course is an introduction to computational problem solving and computer programming, with a particular emphasis on applications to engineering problems. It is intended for students with little or no programming background. Students will learn to analyze problems and design algorithms as well as implement their solutions using a high-level programming language such as C++. The programming skills taught in this course are language-agnostic and can be applied to other programming languages as well.

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

Delivery: This course is delivered face-to-face.

COTR Credits: 3

Hours for this course: 90 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	45
Seminars / Tutorials	
Laboratory / Studio Hours	45
Practicum / Field Experience Hours	
Other Contact Hours	
Total	90

Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-job Experience	N/A
Formal Work Experience	N/A
Other	N/A
Total	

Course Outline Author or Contact:
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Signature

APPROVAL SIGNATURES:

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EDCO

Valid from: September 2023 – April 2028

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: Minimum 65% in either MATH 090, MATH 100, Pre-Calculus 11 AND Pre-Calculus 12; or Pre-Calculus 12 and a minimum of 75% in Calculus 12 or equivalent. It is recommended that students have programmed in some programming language before.

Flexible Assessment (FA):

Credit can be awarded for this course through FA ☑ Yes ☐ No

Learners may request formal recognition for flexible assessment at the College of the Rockies through one or more of the following processes: External Evaluation, Worksite Assessment, Demonstration, Standardized Test, Self-assessment, Interview, Products/Portfolio, Challenge Exam. Contact an Education Advisor for more information.

Transfer Credit: For transfer information within British Columbia, Alberta and other institutions, please visit http://www.cotr.bc.ca/Transfer.

Students should also contact an academic advisor at the institution where they want transfer credit.

Prior Course Number: COMP 105 → CSCI 105
Date changed: June 2023

Textbooks and Required 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

- explain the major components of a computer system, different types of programming languages, and related terminology;
- apply basic data types, variables, constants, operators, expressions, and control structures;
- implement, test, and debug algorithms for syntax, run-time, and logic errors;
- utilize top-down computer programming by breaking down a complex project into smaller, manageable subroutines for either individual or group work;
- apply consistent documentation and program style standards to create readable and maintainable software;
- implement programs that use advanced types and data structures like arrays, structs, strings, enumerated data types, pointers, and dynamic data structures; and
- produce a project that applies a variety of course topics to a program designed for a specific problem, plan it, develop it, exercise quality control over it, document it, and see it to conclusion before a fixed deadline.

COURSE TOPICS:

- **Introduction:**
  Introduction to computer hardware, software, and career opportunities

- **Using the integrated development environment**

- **The C/C++ Language:**
  Specific syntax and limitations including data types, statements, operators, expressions, control structures (loops and conditional statements), functions, arrays, structs, unions, enumerations, pointers, strings, recursion, basic file I/O.

- **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; introduction to classes.

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

EVALUATION AND ASSESSMENT:

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

Please see the instructor syllabus for specific classroom policies related to this course, such as details of evaluation, penalties for late assignments and use of electronic aids.

EXAM POLICY:

Students must attend all required scheduled exams that make up a final grade at the appointed time and place.

Individual instructors may accommodate for illness or personal crisis. Additional accommodation will not be made unless a written request is sent to and approved by the appropriate Department Head prior to the scheduled exam.

Any student who misses a scheduled exam without approval will be given a grade of "0" for the exam.

COURSE GRADE:

Course grades are assigned as follows:

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Mark (Percent)	≥ 90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	< 50

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

ACADEMIC POLICIES:

See www.cotr.bc.ca/policies for general college policies related to course activities, including grade appeals, cheating and plagiarism.

COURSE CHANGES:

Information contained in course outlines is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational, employment and marketing needs. The instructor will endeavour to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.