NORTHWESTERN POLYTECHNIC

DEPARTMENT OF SCIENCE

COURSE OUTLINE – Fall 2025

CS2010 (UT): Practical Programming Methodology – 3 (3-0-3) 90 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR:	Franco Carlacci	**PHONE:**	780 539 2091
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OFFICE HOURS:	TBA		

CALENDAR DESCRIPTION:

This course introduces you to the principles, methods, tools, and practices of a professional programmer working in a rich programming environment. The lectures focus on the fundamental principles of programming methodology based on abstract data types and their implementations. The laboratories offer an intensive apprenticeship opportunity for the aspiring software developer. You will use the programming languages C and C++ and software development tools supported by the Microsoft Windows and UNIX programming environment.

PREREQUISITE(S)/COREQUISITE: CS1150

REQUIRED TEXT/RESOURCE MATERIALS:

There is no required text for this course; however, my notes are based two texts: Programming Principles and practices using C++ by Bjarne Stroustrup and C++ Primer, fifth edition by Lippman, Lajoie and Moo. All course/resource materials will be available on myClass.

DELIVERY MODE(S): in-class delivery

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NORTHWESTERN POLYTECHNIC

LEARNING OUTCOMES:

- Student should be able to design C/C++ programs using procedural-based design techniques.
- Students should be able to design C++ programs using object-based / object-oriented design techniques
- Students should be able to use development tools such as git, github, make, vi, and gcc/g++.
- Students should also be familiar with other tools such as Visual Studio /Netbeans
- Students should be familiar with and be able to use the Standard Template Library.
- Students should have the skills to combine knowledge of program design and data structures with useful algorithms and mathematics and application specific knowledge to design and implement non-trivial software.

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page http://www.transferalberta.alberta.ca.

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. **Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.**

EVALUATIONS:

Assignments	30%
Quizzes	10%
Midterm	25%
Final	35%

GRADING CRITERIA

Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

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Alpha Grade	4-point Equivalent	Percentage Guidelines		Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	95-100		C+	2.3	67-69
A	4.0	85-94		C	2.0	63-66
A-	3.7	80-84		C-	1.7	60-62
B+	3.3	77-79		D+	1.3	55-59
B	3.0	73-76		D	1.0	50-54
B-	2.7	70-72		F	0.0	00-49

COURSE SCHEDULE/TENTATIVE TIMELINE:

C / C++ basics

- C++/C variables, types
- Compound type – references, pointers
- const, auto, typedef • C-style strings, C++ string, vector class
- C arrays
- introduction to iterators

Expressions

- arithmetic, logical, relational operators
- Assignment, Member access(.), conditional operators, sizeof, comma operators
- type conversions
- operator precedence

Statements

- simple statements
- statements as expressions
- Conditional, iterative, jump (break, continue, goto) statements
- exception handling

functions

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- separate compilation of functions/programs
- functions declarations
- Argument passing – value, reference, pointers
- return types
- function as first-class objects – lambda expressions
- default arguments, inline, overloading of functions

- local/global variables

Classes / Objected-Oriented programming

- defining base and derived class
- virtual functions / abstract classes
- public/private/ protected access
- public/private/ protected inheritance
- friend functions

Templates and Generic programming

- Defining function and class templates

Standard Template Library

- generic algorithms
- Sequential containers – vector, string
- Associative containers – map, multimap, set, multiset
- adaptors – stack, queue, deque, priority queue

STUDENT RESPONSIBILITIES:

1. The student must pass the theory/concepts portion of the course in order to qualify for a passing grade for the term. In other words, a student must obtain 35 out of a possible 70 points (from final exams/midterm) before adding the assignment marks to compute the final grade. If you cannot achieve the required 50% on the theory/concept portion then regardless of your assignment grades, you cannot pass the course.
2. Student are responsible for adhering to all requirements laid out in the assignments.
3. Students must attend all lectures/labs. A student missing more than 20% of classes/labs may be barred from writing the final exam.
4. Assignments MUST be submitted on their due date. Late assignments will NOT be accepted and will receive a grade of 0.

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STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at https://www.nwpolytech.ca/about/administration/policies/index.html.

**Note: all Academic and Administrative policies are available on the same page.

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