![Northwestern Polytechnic logo]

DEPARTMENT OF SCIENCE

COURSE OUTLINE – Fall 2023

CS2290 – COMPUTER ORGANIZATION AND ARCHITECTURE I - 3 (3-0-3) 6 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:	Libero Ficocelli	**PHONE:**	780 539 - 2825
OFFICE:	C307	**E-MAIL:**	LFicocelli@NWPolytech.ca

OFFICE HOURS: TBA

CALENDAR DESCRIPTION:

General introduction to number representation, architecture and organization concepts of von Neumann machines, assemble level programming, exception handling, peripheral programming, floating point computations and memory management.

PREREQUISITE(S)/COREQUISITE: CS1150

REQUIRED TEXT/RESOURCE MATERIALS:

Assembly Language for x86 Processors, 7th Edition (6th Edition is acceptable)

By Kip R. Irvine, Pearson Publishing,

ISBN 0-13-376940-2

DELIVERY Mode: Onsite face-to-face.

LEARNING OUTCOMES:

- Understand computer data representation
- Know basic processor architecture and memory management
- Be able to write, assemble, and debug Intel Assembler code
- Be able to perform conditional processing and Integer arithmetic, use code libraries, code procedures and advanced procedures and use string manipulation routines
- List the basic components of a modern CPU

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.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:

Lab/Homework

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

GRADING CRITERIA:

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:

Introduction to Computer Architecture:

- Microprocessor and computer architecture
- Operations and operands of computer hardware
- Representing instructions

Number systems and Arithmetic

- Signed and Unsigned Numbers
- Addition and Subtraction
- Logical Operations
- Constructing an Arithmetic Logic Unit
- Multiplication and Division
- Floating Point numbers

80x86 Assembly

- Overview of 80x86 assembler (segments, registers and organization)
- Program structure
- I/O operations
- Data movement instructions
- Conditionals and Branching instructions
- Arrays
- Procedures
- Interrupts
- String processing
- Video operations (text and graphics)
- Parameter passing and stack operations

STUDENT RESPONSIBILITIES:

- 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 exams/quizzes) before adding the lab assignment marks to compute the final grade. If you cannot achieve the required 50% (on exams) then regardless of your lab assignment grades, you cannot pass the course.
- No late assignments will be accepted. The student is responsible for
- adhering to all requirements as specified for each assignment.
- When necessary, lab time may be utilized for lecturing on specific Assembly language features. The remainder of the lab time will generally be used as "hands-on" programming time.

STATEMENT ON PLAGIARISM AND CHEATING:

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the College Calendar at https://www.nwpolytech.ca/programs/calendar/ or the College Policy on Student Misconduct: Plagiarism and Cheating at https://www.nwpolytech.ca/about/administration/policies/index.html

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