



DEPARTMENT OF SCIENCE

COURSE OUTLINE – Fall 2021

CS2290 – COMPUTER ORGANIZATION AND ARCHITECTURE I - 3 (3-0-3) 90 HOURS

Grande Prairie Regional College respectfully acknowledges that we are located on Treaty 8 territory, the traditional homeland and gathering place for many diverse Indigenous peoples. We are honoured to be on the ancestral lands of the Cree, Dene/Beaver and Métis, whose histories, languages, and cultures continue to influence our vibrant community. We are grateful to have the opportunity to work, learn, and live on this land.

INSTRUCTOR: Libero Ficocelli

PHONE: 780 539 - 2825

OFFICE: C424

E-MAIL: LFicocelli@gprc.ab.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.

COURSE OBJECTIVES:

- Learn the fundamentals behind program execution
- Understand how a modern CPU works

- Learn how machine code is generated by a compiler
- Understand the interface between software and hardware

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	90-100		C+	2.3	67-69
A	4.0	85-89		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
- Macros and 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 <http://www.gprc.ab.ca/programs/calendar/> or the College Policy on Student Misconduct: Plagiarism and Cheating at <https://www.gprc.ab.ca/about/administration/policies>

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