# DEPARTMENT OF SCIENCE

## COURSE OUTLINE – Fall 2015

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

**INSTRUCTOR:**  Libero Ficocelli     **PHONE:**  780 539 - 2825

**OFFICE:**  C424     **E-MAIL:**  LFicocelli@gprc.ab.ca

**OFFICE HOURS:**  TBA

**DELIVERY MODE(S):**  In class lecture

**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

**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.

**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 rountines
- List the basic components of a modern CPU

## 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

## 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

## EVALUATIONS:

| | |
|---|---|
| Lab/Homework Assignments | 30% |
| Class Quizzes | 10% |
| Midterm | 25% |
| Final Exam | 35% |

## GRADING CRITERIA:

| | GRANDE PRAIRIE REGIONAL COLLEGE | | |
|---|---|---|---|
| | GRADING CONVERSION CHART | | |
| Alpha Grade | 4-point Equivalent | Percentage Guidelines | Designation |
| A$^+$ | 4.0 | 90 – 100 | EXCELLENT |
| A | 4.0 | 85 – 89 | |
| A$^-$ | 3.7 | 80 – 84 | FIRST CLASS STANDING |
| B$^+$ | 3.3 | 77 – 79 | |
| B | 3.0 | 73 – 76 | GOOD |
| B$^-$ | 2.7 | 70 – 72 | |
| C$^+$ | 2.3 | 67 – 69 | SATISFACTORY |
| C | 2.0 | 63 – 66 | |
| C$^-$ | 1.7 | 60 – 62 | |
| D$^+$ | 1.3 | 55 – 59 | MINIMAL PASS |
| D | 1.0 | 50 – 54 | |
| F | 0.0 | 0 – 49 | FAIL |
| WF | 0.0 | 0 | FAIL, withdrawal after the deadline |

## STUDENT RESPONSIBILITIES:

Refer to the College Policy on Student Rights and Responsibilities at
www.gprc.ab.ca/d/STUDENTRIGHTSRESPONSIBILITIES

- The Student must pass the theory/concepts portion of the course in order to obtain a passing grade for the term. In other words a student must obtain 50% out of a possible 70 points - which includes all components except the lab assignments.

- No late project assignments will be accepted. The student is responsible for adhering to all requirements as specified for each project assignment.

- When necessary lab time may be utilized for lecturing on specific Java features. The remainder of the lab time will generally be used as "hands-on" programming time.

## STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the College Student Misconduct: Academic and Non-Academic Policy at
www.gprc.ab.ca/d/STUDENTMISCONDUCT

**Note: all Academic and Administrative policies are available at
www.gprc.ab.ca/about/administration/policies/

## *UNIVERSITY TRANSFER (If applicable)*:

** 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.**

Please refer to the Alberta Transfer guide for current transfer agreements:
www.transferalberta.ca