



## DEPARTMENT OF SCIENCE

### COURSE OUTLINE – Fall 2016

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

**INSTRUCTOR:** Libero Ficocelli

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**OFFICE:** C424

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**OFFICE HOURS:** TBA

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

**PREREQUISITE(S)/COREQUISITE:** CS1150

#### **REQUIRED TEXT/RESOURCE MATERIALS:**

Assembly Language for x86 Processors, 7th Edition (6<sup>th</sup> 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 routines
- 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:**

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

### **STUDENT RESPONSIBILITIES:**

Refer to the College Policy on Student Rights and Responsibilities at [www.gprc.ab.ca/d/STUDENTRIGHTSRESPONSIBILITIES](http://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](http://www.gprc.ab.ca/d/STUDENTMISCONDUCT)

\*\*Note: all Academic and Administrative policies are available at [www.gprc.ab.ca/about/administration/policies/](http://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.transferralberta.ca](http://www.transferralberta.ca)