

Effective: Spring 2022

**COURSE INFORMATION**

**Course Title:** Introduction to Computer Systems

**Course Number:** CSCI 250

**Credits:** 3

**Total Weeks:** 14 (Fall, Spring)  
12 (Summer)

**Total Hours:** 39

**Course Level:**  First Year  Second Year  
 New  Revised Course  
 Replacement Course

**Department:** Computer Science **Department Head:** M. O'Connor **Former Course Code(s) and Number(s) (if applicable):** N/A

**Pre-requisites (If there are no prerequisites, type NONE):** CSCI 150

**Co-requisite Statement (List if applicable or type NONE):** NONE

**Precluded Courses:** N/A

**COURSE DESCRIPTION**

This course focuses on computer systems and low-level programming. The major topics are the relationship between the computer architecture (the hardware) and the applications that run on it (the software), and the issues that influence the design of both. Programs will be written in both C and x86-64 assembly and may involve some GNU tools in the Linux environment. We will explore how instructions are encoded and executed and how binary data types are encoded and interpreted by computer hardware, and how these matters relate to the performance and reliability of applications.

**LEARNING OUTCOMES**

Upon successful completion of the course, students will be able to:

- Machine learning programs
- Representation of symbolic and numeric data
- Representation of instructions (instruction set architecture)
- Machine code optimization
- Basic digital systems
- CPU organization
- Memory organization
- Threads and synchronization (time permitting)

**INSTRUCTION AND GRADING**

Instructional (Contact) Hours:

Type	Duration
Lecture	39
Seminars/Tutorials	
Laboratory	
Field Experience	
Other ( <i>specify</i> ):	
Total	39

**Grading System:** Letter Grades  Percentage  Pass/Fail  Satisfactory/Unsatisfactory  Other

**Specify passing grade:** 50%

**Evaluation Activities and Weighting** (total must equal 100%)

Assignments: 5% <i>Specify number of, variety, and nature of assignments:</i>	Lab Work: %	Participation: 5% <i>Specify nature of participation:</i>	Project: % <i>Specify nature of project:</i>
Quizzes/Test: 20%	Midterm Exam: 25%	Final Exam: 45%	Other: %

**TEXT(S) AND RESOURCE MATERIALS**

Provide a full reference for each text and/or resource material and include whether required/not required.

Computer Systems Mastering Engineering with Pearson eText -- Standalone Access Card

Computer Systems: A Programmer's Perspective, 3/E, Randal E. Bryant, David R. O'Halloran, Pearson, 2016, 9780134071923. Textbook can be ordered directly online from Pearson or from the College bookstore.

**COURSE TOPICS**

List topics and sequence covered.

- Week 1 Introduction to the Computer Systems
- Week 2 Representation and Manipulation Information
- Week 3 Machine-Level Representation of Program
- Week 4 Processor Architecture  
Quiz 1
- Week 5 Optimizing Program Performance
- Week 6 The Memory Hierarchy
- Week 7 **Midterm**
- Week 8 Linking
- Week 9 Exceptional Control Flow
- Week 10 Virtual Memory
- Week 11 System Level IO
- Week 12 Network Programming
- Week 13 Concurrent Programming
- Week 14 **Final Exam**

**NOTES**

1. Students are required to follow all College policies. Policies are available on the website at: [Coquitlam College Policies](#)
2. To find out how this course transfers, visit the BC Transfer Guide at: [bctransferguide.ca](http://bctransferguide.ca)

**Last Revised:** January 2022

**Last Reviewed:** September 2024