

Last Revised: December 2020

COURSE INFORMATION

Course Title: Introduction to Computer Science & Programming II

Course Number: CSCI 125

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):

- Math 12 or equivalent and CSCI 120

Co-requisite Statement (List if applicable or type NONE): CSCI 127

Precluded Courses: N/A

COURSE DESCRIPTION

This course is a thorough introduction to computer science and computer programming, suitable for students with some computer science background. It is designed for students who will major in computing science or a related program. Students will learn fundamental concepts and terminology of computer programming and acquire basic programming skills in the Java programming language. Topics covered are: primitive and abstract data types, elementary data structures, fundamental algorithms, algorithm analysis, basic object-oriented programming and software design, specification and program correctness, and historical aspects of computing science.

LEARNING OUTCOMES

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

- Cite some historical facts of computer science and programming.
- Demonstrate how to choose primitive data types appropriately.
- Know the difference between primitive data types and reference data types.
- Describe and apply techniques to document programs.
- Demonstrate how to use control structures appropriately.
- Demonstrate how to use text files for input and output.
- Know how to construct safe programs.
- Explain and use simple abstract data types such as list, stack and queue.
- Demonstrate how to design and use classes.
- Demonstrate how to use modeling tools such as UML, for object-oriented design.
- Know data structures from the Java Collections API such as arrays, lists and dictionaries.
- Demonstrate how to use single and multi-dimensional arrays.
- Know and analyze fundamental searching and sorting algorithms.
- Explain and apply the concepts of Object-Oriented Programming.
- Define and use recursive algorithms for problem solving.

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: 15% <i>Specify number of, variety, and nature of assignments:</i> | Lab Work: % | Participation: % <i>Specify nature of participation:</i> | Project: % <i>Specify nature of project:</i> |
| Quizzes/Test: % | Midterm Exam: 50% | Final Exam: 35% | Other: % |

TEXT(S) AND RESOURCE MATERIALS

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

Tony Gaddis, Godfrey Muganda: Starting Out with Java: From Control Structures through Data Structures, 3rd Edition. Pearson. 2016. ISBN 0134038177 • 9780134038179.

COURSE TOPICS

List topics and sequence covered.

| Week | Topic |
|--------|---|
| Week 1 | Introduction to Java, OOP, and Program Design |
| Week 2 | Primitive data types and their operations |
| Week 3 | Decision and loop control structures, File input and output |
| Week 4 | Methods |
| Week 5 | Midterm Exam 1 / Introduction to Classes and Objects, UML diagrams |
| Week 6 | Introduction to Arrays and the ArrayList Class |

| | |
|---------|---|
| Week 7 | Sorting and Searching Algorithms, Algorithm Analysis |
| Week 8 | More about Classes and Objects |
| Week 9 | Midterm Exam 2 / Test Processing and Wrapper Classes |
| Week 10 | Inheritance and Polymorphism |
| Week 11 | Exceptions |
| Week 12 | Recursion |
| Week 13 | Abstract Data Types |
| 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