

Macao Polytechnic Institute
School of Applied Sciences
Bachelor of Science in Computing
Course Syllabus
Academic Year 2019/2020 Semester 1

Course Title	Programming I			Course Code	COMP112
Pre-requisite Course	Nil				
Language of Instruction	English			Credit	3
Course Duration (Theory)	35 hrs	Course Duration (Practice)	10 hrs	Total Course Duration	45 hrs
Teacher(s) / Title	Calana Chan			E-mail	calanachan@ipm.edu.mo
Office	Rm.511,MengTak Building			Telephone	8599 3277

Course Description:

This course introduces the fundamentals of computer programming and problem solving, with a brief introduction to graphics programming. The course covers essential programming topics including the structure of programs, variables, primitive data types, expressions, statements, conditionals, loops, methods and arrays.

Learning Outcomes:

After completing the course, students will be able to:

1. Acquire the fundamental programming technique; (EA1p, SM2p)
2. Read and analyze problem specifications; (D1p)
3. Analyze practical problems and write programmatic steps, such as flowcharts, to solve the problems; (SM2p, EA3p)
4. Convert flowcharts to Java programs; (EA1p)
5. Develop programs in a structured manner; (EA1p)
6. Run, test and debug simple Java programs; (EP3p)
7. Structure related data by grouping them in arrays. (EA1p, EA3p)

Content:

1. Introduction to Computer Programming (6 hours)
 - 1.1 Introduction
 - 1.2 The History of Programming Languages
 - 1.3 Flowchart
 - 1.4 The Structure of Java Programs
 - 1.5 Creating, Compiling, and Executing a Java Program
2. Identifiers, Variables and Data Types (6 hours)
 - 2.1 Identifiers and their Naming Conventions
 - 2.2 Variables, Assignment Statements and Assignment Expressions
 - 2.3 Primitive Data Types
 - 2.4 Numeric Expressions
 - 2.5 Characters and Strings
 - 2.6 Booleans
3. Control Flow Statements (9 hours)
 - 3.1 Conditional Statements and Expressions
 - 3.2 The Switch-Case Statement
 - 3.3 Loops
 - 3.4 Local Variables
 - 3.5 Operator Precedence and Associativity
 - 3.6 Logical Operators
4. Methods (6 hours)
 - 4.1 Method Definition with Formal Parameters
 - 4.2 Invoking Methods with Actual Parameters
 - 4.3 Difference between a Void and Value-returning Method
 - 4.4 Passing Arguments and Obtaining Results
 - 4.5 Method Overloading
 - 4.6 Scope of Variables

- 5. Arrays (6 hours)
 - 5.1 Introduction to Arrays
 - 5.2 Copying Arrays
 - 5.3 Passing Arrays to Methods
 - 5.4 Returning Arrays from a Method
 - 5.5 Searching and Sorting Arrays
- 6. GRAPHICS (6 hours)
 - 6.1 Graphics Class
 - 6.2 Drawing Graphics
 - 6.3 Line, Rectangles, and Ovals
- 7. Text I/O (3 hours)
 - 7.1 Writing to a File
 - 7.2 Reading from a File
- 8. RECURSION (3 hours)
 - 8.1 Introduction to Recursion
 - 8.2 Example: Factorials
 - 8.3 Example: Fibonacci Numbers
 - 8.4 Problem Solving Using Recursion

Teaching Method:

Lectures and tutorials

Attendance:

Attendance requirements are governed by the Academic Regulations. Students who do not meet the attendance requirements for the course will not be permitted to sit the final and re-sit examination and shall be awarded an 'F' grade.

Assessment:

This course is graded on a 100 point scale, with 100 being the highest possible score and 50 the pass score.

Item	Description	AHEP3 LO	Percentage
1. Assignments	Home-based exercises	EA1p, EA3p, SM2p, EP3p	20%
2. Exercises	Class-based	EA1p, EA3p, SM2p, EP3p	10%
3. Tests	Knowledge assessment	EA1p, EA3p	25%
4. Examination	3-hour written examination	EA1p, EA3p, D1p, SM2p	45%
Total Percentage:			100%

Students with an overall score of less than 35 in the coursework must take the re-sit examination even if the overall score for the course is 50 or above.

Students with a score of less than 35 in the final examination must take the re-sit examination even if the overall score for the course is 50 or above.

Students with an overall final grade of less than 35 are NOT allowed to take the re-sit examination.

Teaching Material:

Textbook

1. Liang, Y. Daniel. (2018). *Introduction to Java Programming and Data Structures, Comprehensive Version* (11th edition). Prentice Hall.

Reference:

Reference book

1. Cay S. Horstmann. (2016). *Core Java Volume I — Fundamentals* (10th edition). Prentice Hall.
2. Walter Savitch. (2014). *Java: An Introduction to Problem Solving and Programming* (7th edition). Pearson.