

Macao Polytechnic University
Faculty of Applied Sciences
Bachelor of Science in Computing
Module Outline

Academic Year 2022 / 2023 Semester 1

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|------------------------------|---|---------------------------|------------------|-----------------------|---------|
| Learning Module | Programming I | | | Class Code | COMP112 |
| Pre-requisite(s) | Nil | | | | |
| Medium of Instruction | English | | | Credit | 3 |
| Lecture Hours | 35 hrs | Lab/Practice Hours | 10 hrs | Total Hours | 45 hrs |
| Instructor | Calana Chan | | E-mail | calanachan@mpu.edu.mo | |
| Office | Rm.511, Meng Tak Building, Main Campus | | Telephone | 8599-3277 | |

Description

This learning module introduces the fundamentals of computer programming and problem solving. The learning module 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 learning module, 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 (7.5 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 (7.5 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 [optional topic] (3 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 Problem Solving Using Recursion

Teaching Method

Lectures, lab practice and tutorials.

Attendance

Attendance requirements are governed by the “Academic Regulations Governing Bachelor’s Degree Programmes” of Macao Polytechnic University. Students who do not meet the attendance requirements for the module will not be permitted to sit the final or re-sit examination and shall be awarded an ‘F’ grade.

Assessment

This learning module is graded on a 100 point scale, with 100 being the highest possible score and 50 being the passing score.

| Item | Description | AHEP3 LO | Percentage |
|--------------------------|----------------------------|-------------------------|-------------------|
| 1. Assignments | Home-based exercises | EA 1p, EA3p, SM2p, EP3p | 15% |
| 2. Exercises | Class-based | EA 1p, EA3p, SM2p, EP3p | 10% |
| 3. Tests | Knowledge assessment | EA 1p, EA3p | 30% |
| 4. Examination | 3-hour written examination | EA 1p, 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 module 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 module 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(s)

Liang, Y. Daniel. (2019). *Introduction to Java Programming and Data Structures, Comprehensive Version* (12th edition). Pearson.

Reference

Reference book(s)

Walter Savitch. (2017). *Java: An Introduction to Problem Solving and Programming* (8th edition). Pearson.

Bloch, J. (2018), *Effective Java* (3rd Edition). Addison-Wesley.