UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Programmazione 2

2526-1-E3102Q105

Aims

The course has the following specific learning objectives:

- Knowledge and understanding (DdD 1): Acquire a solid understanding of the principles of object-oriented programming and how they are implemented in the Java language.
- Applying knowledge and understanding (DdD 2): Be able to develop Java programs by correctly applying object-oriented principles and adopting good programming and software testing practices.

Contents

Object-oriented programming using Java. Usage of some Java libraries. Eclipse as IDE. Testing and debugging exploiting JUnit.

Detailed program

1) Introduction
- introduction to the Java Virtual Machine (JVM) and the lifecycle of a Java program.
- mapping of procedural constructs from C (types, variables, control structures, functions) to the Java language.
- use of the command-line interface for compiling and running Java programs.

2) Basic concepts related to object-oriented programming:
- analysis, design, and programming
- abstractions: classification, generalization, aggregation
- Object-Oriented Programming

3) Class definition and objects instantiation:
- from the class diagram to Java classes
- memory management and references
- 1 to 1 associations
- 1 to many associations
- lists

4) Methods:
- instance methods
- overloading
- parameters of type class
- class method

5) Information hiding e encapsulation
- get e set methods
- visibility
- constructors

6) Eclipse, Junit, and Debug

7) Inheritance
- basic concepts
- overriding
- costructors in derived classes
- polymorphism
- abstract classes and interfaces

8) Exceptions
- exception handling
- definition of exception classes

9) Examples of standard libraries:
- I/O
- collection framework

10) Advanced concepts
- introduction to generics
- introduction to lambda expressions
- introduction to streams

Prerequisites

Imperative programming (see Programming 1)

Teaching form

Lectures and recitations. Practice labs via e-learning, with tutor support and auxiliary leaning material (exercises, self-test questions).
The in-class lectures follow the "modalità erogativa" and "modalità interattiva" modes. The activities performed on

the elearning platform also follow both modes.
The course will be given in Italian.

Textbook and teaching resource

Programmazione di base e avanzata con Java - terza edizione, Walter Savitch e Daniela Micucci, Edizione in Italiano, ISBN 9788891916020, Pearson, 2024

Semester

Second semester.

Assessment method

The assessment of the exam consists of a written test, which is divided into two parts:

- The first part aims to assess theoretical knowledge. The test consists of a set of closed-answer questions.
- The second part aims to assess practical skills. The test consists in the implementation of a Java program whose specification is provided as a UML class diagram.

Evaluation criteria used: correctness of the answers given in the first part; quality of the solution and absence of redundancy in the second part.

During the course, two intermediate tests will be provided. These tests are written exams organized as described above. The passing of both intermediate tests allows the passing of the exam. The evaluation criteria are the same as for the overall verification.

Office hours

Contact by e-mail.

Sustainable Development Goals