COURSE DETAILS

"PROGRAMMAZIONE"

SSD ING-INF/05

DEGREE PROGRAMME: BACHELOR DEGREE IN COMPUTER ENGINEERING

ACADEMIC YEAR: 2023-2024

GENERAL INFORMATION – TEACHER REFERENCES

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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE (IF APPLICABLE): N.A.

MODULE (IF APPLICABLE): N.A.

CHANNEL (IF APPLICABLE): N.A.

YEAR OF THE DEGREE PROGRAMME (I, II, III): II

SEMESTER (I, II): II

CFU: 6

REQUIRED PRELIMINARY COURSES (IF MENTIONED IN THE COURSE STRUCTURE "REGOLAMENTO")

Fondamenti di Informatica.

PREREQUISITES (IF APPLICABLE)

None beyond the skills provided by the course of Fundamentals of Computer Science.

LEARNING GOALS

The course aims to provide students with the methodological, theoretical and practical skills of modular programming and object-oriented programming, necessary for the correct development of small and medium-sized software projects.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student must demonstrate knowledge and ability to elaborate the concepts underlying programming. The training course aims to provide the knowledge and tools that will allow students to develop autonomous skills in designing and developing applications according to the object-oriented programming paradigm.

Applying knowledge and understanding

The student must demonstrate the ability to apply the skills acquired by designing and implementing simple software applications, using the reference programming language (Java) and the UML language. In particular, he must be able to recognize and implement the relationships between classes and objects in the domain and in the proposed context and know how to implement the basic data structures (list, stack, queue, trees).

COURSE CONTENT/SYLLABUS

- ***References and fundamentals of programming in Java:*** Java language and comparison with other languages, in particular with C / C ++: development cycle of a Java program, Java Virtual Machine, bytecode. SDK, lifecycle of classes, objects and variables, type system, operators and structures for flow control in Java; Cut motions, parameter exchange.
- ***Modular programming***: abstraction on data and control, the concept of module, relationships between modules, cohesion and coupling, information hiding, abstract data type (ADT), ADT design, the role of interfaces. Techniques and tools for modularization, separate compilation, the make utility.
- ***Fundamental data structures*****:** Lists, Stacks, Queues, Trees, Fundamental algorithms (search, sorting).
- ***Object-oriented programming****:* The OO paradigm; Encapsulation, Classes and Objects, Overloading and Overriding, relationships between classes: composition, association and inheritance; derived classes and base-derived relationship, Polymorphism.
- ***Object-oriented programming in Java****:* classes and objects, inheritance and polymorphism in Java. Controlling the visibility of attributes and methods. Abstract classes and interfaces. Composition and association in Java. Modularization in Java, package, introduction to libraries.
- ***Error handling in Java*****:** the model for handling exceptions in Java. checked and unchecked exceptions. Exception handling classes. the throwing of exceptions.
- ***Java I/O Management:*** Classes for I/O. Stream and I/O from files.
- ***UML design and language***: Software design (outline); Phases of Object-Oriented Design; The UML language in O.O. design; UML to Java: UML elements for describing classes and class relationships.
- **Design of graphical interfaces in Java.**

READINGS/BIBLIOGRAPHY

Textbook, practice material, transparencies from the lessons.

FOR FURTHER INFORMATION SEE WEBSITE OF THE TEACHER OF THE SUBJECT (www.docenti.unina.it)

TEACHING METHODS

Lectures (50%), exercises (25%) and laboratory activities (25%).

EXAMINATION/EVALUATION CRITERIA

a) Exam type:

Exam type	
written and oral	X
only written	
only oral	
project discussion	
other	

In case of a written exam, questions refer to:	**Multiple choice answers**	
	Open answers	
	Programming exercises	X

b) Evaluation pattern:

The outcome of the written test is binding for access to the oral test. The final grade is the average between the vote of the written test and that of the oral exam.