# SYLLABUS

## COURSE DESCRIPTION – ACADEMIC YEAR 2023/2024

<table>
<thead>
<tr>
<th>COURSE TITLE</th>
<th>Programming Project</th>
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<tbody>
<tr>
<td>COURSE CODE</td>
<td>76204</td>
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<tr>
<td>SCIENTIFIC SECTOR</td>
<td>INF/01</td>
</tr>
<tr>
<td>DEGREE</td>
<td>Bachelor in Computer Science</td>
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<tr>
<td>SEMESTER</td>
<td>2nd</td>
</tr>
<tr>
<td>YEAR</td>
<td>1st</td>
</tr>
<tr>
<td>CREDITS</td>
<td>9</td>
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<table>
<thead>
<tr>
<th>TOTAL LECTURING HOURS</th>
<th>60</th>
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<tbody>
<tr>
<td>TOTAL LAB HOURS</td>
<td>30</td>
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**ATTENDANCE**

Attendance to course lectures and labs is optional. However, non-attending students have to contact the lecturer at the start of the course to discuss the modality of their independent study.

The exam modality for both attending and non-attending students is the same, which is described in the fields “Assessment” and “Evaluation criteria and criteria for awarding marks” below.

**PREREQUISITES**

Students should be familiar with the basic knowledge of object-oriented programming and Java, as taught in the course “Computer Programming”

**COURSE PAGE**

[https://ole.unibz.it/](https://ole.unibz.it/)
### Specific Educational Objectives

Type of course: "caratterizzanti" for L-31  
Scientific area: "Discipline informatiche" for L-31  

The course is designed to provide generic and object-oriented programming skills, as well as a first experience of software development within a team.  

Students will program in Java, but a large part of the acquired knowledge can be transferred to other programming languages.  

After completing this course, students should be able to:  
- design and develop a prototype application in Java,  
- develop algorithms to solve simple programming problems (and select appropriate data structures),  
- write readable, concise, modular and documented code,  
- collaborate with other programmers.

### Lecturer

| Julien Corman |

### Scientific Sector of the Lecturer

| INF/01 |

### Teaching Language

| English |

### Office Hours

| Mondays 16:00-18:00 by prior email appointment. Office POS 2.06, Faculty of Engineering, Piazza Domenicani 3. corman@inf.unibz.it |

### Teaching Assistant

| Albulen Pano |

### Office Hours

| Mondays 16:00-18:00 by prior email appointment. Office POS 2.08, Faculty of Engineering, Piazza Domenicani 3. albulen.pano@unibz.it |

### List of Topics Covered

- Memory models in Java  
- Virtual functions, late binding, overriding, and overloading  
- Exception handling  
- Reflection and runtime type identification  
- Generics and collections  
- I/O, serialization and XML/JSON processing  
- Designing large applications: design patterns  
- Multithreading  
- Code optimization
## TEACHING FORMAT
Frontal lectures, lab exercises, group projects.

## LEARNING OUTCOMES

### Knowledge and understanding
- Know in details the fundamental principles of programming.
- Have a solid knowledge of the most important data structures and programming techniques.

### Applying knowledge and understanding
- Be able to develop small and medium size programs using different programming languages and paradigms.
- Be able to solve problems through the application of programming methodologies.

### Making judgments
- Be able to collect and interpret useful data and to judge information systems and their applicability.
- Be able to work autonomously according to the own level of knowledge and understanding.

### Communication skills
- Be able to use one of the three languages English, Italian and German, and be able to use technical terms and communication appropriately.
- Be able to structure and write scientific documentation.

### Learning skills
- Have acquired learning capabilities to pursue further studies with a high degree of autonomy.

## ASSESSMENT
The assessment is based on:
- **lab exercises**, which are focused on specific topics taught in the course. They are meant to motivate students to study throughout the semester and consolidate the theoretical concepts taught in class;
- a **group project**, which evaluates if students acquired the expected programming knowledge and skills; and
- an **oral exam**, which evaluates if students assimilated of the theoretical concepts taught in class by reviewing and discussing the group project.

## ASSESSMENT LANGUAGE
English

## EVALUATION CRITERIA AND CRITERIA FOR AWARDING MARKS
Final marks will be calculated in the following way:
- up to 30 points will be awarded to assignments;
- up to 60 points will be awarded to the group project;
- up to 10 points will be awarded to the oral exam;

To enroll in the oral exam, a student must:
- Deliver the group project;
- Have earned 40 points from the weekly assignments and the group project combined.

- Lecture notes handed out during the course |


<table>
<thead>
<tr>
<th>(<a href="https://code.visualstudio.com/">https://code.visualstudio.com/</a>) or NetBeans (<a href="https://netbeans.apache.org/">https://netbeans.apache.org/</a>)</th>
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</thead>
<tbody>
<tr>
<td>JDK 17</td>
</tr>
<tr>
<td>Git</td>
</tr>
<tr>
<td>Linux or macOS recommended.</td>
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