SYLLABUS
COURSE DESCRIPTION

COURSE TITLE	**Programming Project**
COURSE CODE	76204
SCIENTIFIC SECTOR	INF/01
DEGREE	Bachelor in Computer Science
SEMESTER	2nd
YEAR	1st
CREDITS	9

TOTAL LECTURING HOURS	60
TOTAL LAB HOURS	30
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/

SPECIFIC EDUCATIONAL OBJECTIVES	Type of course: "caratterizzanti" for L-31 Scientific area: "Discipline informatiche" for L-31 The course is designed to give specific professional skills. It will provide students with advanced techniques in Java. In particular, students will acquire knowledge in the overall architecture and components of Java SDK and JRE, use of advanced programming techniques (e.g. multi-threads, reading/writing streams, generics, regular expressions, exception handling and testing) and code documentation (e.g. generate API documentation) of the software developed.

LECTURER	Tiago Prince Sales
SCIENTIFIC SECTOR OF THE LECTURER	INF/01

TEACHING LANGUAGE	English
OFFICE HOURS	Tuesdays, from 08:00 to 10:00, by prior email appointment tiago.princesales@unibz.it. Office POS 3.05 Faculty of Computer Science, Piazza Domenicani 3.
TEACHING ASSISTANT	Tiago Prince Sales Lanti Davide
OFFICE HOURS	Lanti Davide: Mondays 16:00-18:00 by prior email appointment, office POS 2.06, Faculty of Computer Science, Piazza Domenicani 3 davide.lanti@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: • weekly **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 10 points will be awarded to weekly assignments; - up to 60 points will be awarded to the group project; - up to 30 points will be awarded to the oral exam; To enroll in the oral exam, a student must: - Deliver all weekly assignments; - Deliver the group project; - Have earned 30 points from the weekly assignments and the group project combined.

REQUIRED READINGS	- Paul Deitel, Harvey Deitel. **Java How to Program, Early Objects, Eleventh Edition**, Pearson, 2017, ISBN 9780134751962. Permanent link: http://ubz-primo.hosted.exlibrisgroup.com/UNIBZ:All:39UBZ_ALMA_DS511296858 50001241 - Lecture notes handed out during the course
SUPPLEMENTARY READINGS	- Jon Loeliger, Matthew McCullough. **Version Control with Git, 2nd Edition**, 2012, O'Reilly Media, Inc., ISBN 9780596520120. Permanent link: https://ubz-primo.hosted.exlibrisgroup.com/permalink/f/pok0fm/39UBZ_ALMA_DS5 1185432710001241 - Robert C. Martin. **Clean Code**, 2008, Prentice Hall, ISBN 9780136083238. Permanent link: https://ubz-primo.hosted.exlibrisgroup.com/permalink/f/1t65344/39UBZ_ALMA_DS 51208133560001241 - Jeff Friesen. **Java I/O, NIO and NIO.2**, Apress, 2015, ISBN 9781484215654. Permanent link: https://ubz-primo.hosted.exlibrisgroup.com/permalink/f/pok0fm/39UBZ_ALMA_DS5 1184522190001241 - Brian Goetz, Tim Peierls, Joshua Bloch, Joseph Bowbeer, David Holmes, Doug Lea. **Java Concurrency in Practice**, 2006, Addison-Wesley Professional, ISBN 0321349601. Permanent link: https://ubz-primo.hosted.exlibrisgroup.com/permalink/f/pok0fm/39UBZ_ALMA_DS5 1184497210001241 - Shekhar Gulati, Rahul Sharma. **Java Unit Testing with JUnit 5: Test Driven Development with JUnit 5**, 2017, Apress, ISBN 9781484230152. Permanent link: https://ubz-

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- Jeff Langr, Andy Hunt, Dave Thomas. **Pragmatic Unit Testing in Java 8 with JUnit**, 2015, Pragmatic Bookshelf, ISBN 9781941222591. Permanent link: https://ubz-primo.hosted.exlibrisgroup.com/permalink/f/pok0fm/39UBZ_ALMA_DS51184932160001241

- Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides. **Design Patterns: Elements of Reusable Object-Oriented Software**, 1994, Addison-Wesley Professional, ISBN 0201633612. Permanent link: https://ubz-primo.hosted.exlibrisgroup.com/permalink/f/1t65344/39UBZ_ALMA_DS51184149850001241

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SOFTWARE USED
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- IDE for Java programming, e.g. Eclipse (https://www.eclipse.org/), IntelliJ IDEA (https://www.jetbrains.com/idea/), Visual Studio Code (https://code.visualstudio.com/).
- JDK 13
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