Software Development Methods



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Head of Research



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Our main objective

Learn about concepts and techniques for collaborative development of large and complex software systems

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Course content

Java

OOP in Java

Best practices

Common pitfalls

Agile Technical Practices

Test Driven Development

Refactoring

Continuous Integration

Basics of AI coding

Enablers for effective use

AI-assisted tasks

AI-assisted development

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Why we are teaching this stuff

Java

Gives you a widely-used industry language to learn OOP hands-on

Scales from small apps to distributed systems

Agile Technical Practices

Build your ability to collaborate on shared codebases

Prepare you to adapt when requirements change

Basics of AI coding

Show you where AI genuinely speeds up development

Help you to use AI tools critically, not blindly

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Course format

Interactive lectures

Concepts & techniques

Slides & other material

Q&A

Examples

From theory to practice

Collaborative coding sessions

Tools in action

Exercises

Try on your own

Get feedback from us

Get ready for the exam

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A few trade-offs about the Java part

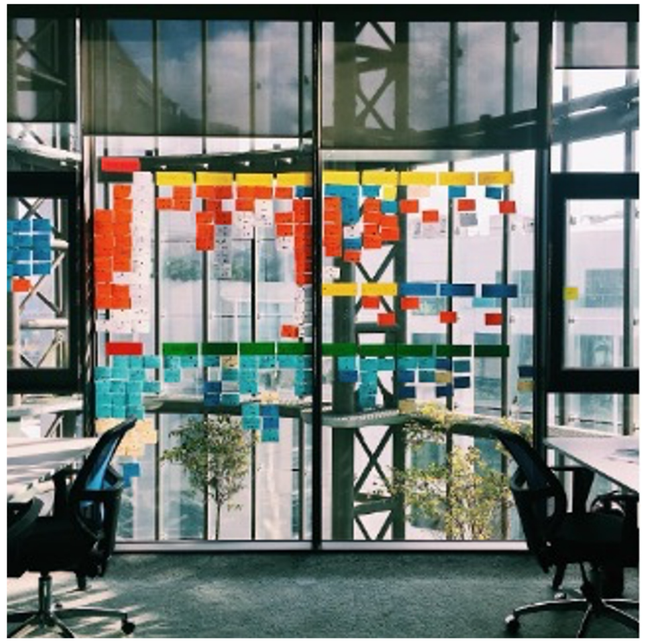
- All the course is based solely on the Java programming language
- From this academic year, 2026-2027, you are expected to know Java at the level taught in “Programmazione Avanzata [143IN]” https://lauree.units.it/it/032010620080001/area-studenti/insegnamenti/2025/118852/2016/6/10424/2023/13467
- If you have any doubt, you can check the “Programmazione Avanzata [143IN]” lectures here https://medvet.inginf.units.it/slides/advanced-programming-2526/#1
- Students from MIGe courses, who usually haven’t any knowledge about Java, should learn the basics of Java by themselves

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Final exam

Group project and presentation.

- Group of 2-4 people
- Project proposed by us or selected by you
- Apply concepts, ideas and practices presented during the course
- Present your results and answer to our questions
- See Moodle for detailed instructions



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Timetable

Monday, from 09:00 to 11:00 (room A, building C7)

Thursday, from 12:00 to 14:00 (room A, building C7)



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Lecture schedule

Date	Lecture	Lecturer
Mon 21-Sep-26	Introduction	Paolo
Thu 24-Sep-26	OOP in Java	Dario
Mon 28-Sep-25	Introduction to Agile Software Development	Dario
Thu 1-Oct-26	Build automation	Dario
Mon 5-Oct-26	Version control	Paolo
Thu 8-Oct-26	Behavior parameterization in Java	Paolo
Mon 12-Oct-26	Streams in Java	Paolo
Thu 15-Oct-26	TDD 1	Dario
Mon 19-Oct-26	TDD 2	Dario
Thu 22-Oct-26	TDD 3, Continuous integration	Dario
Mon 26-Oct-26	Refactoring and readability	Dario
Thu 29-Oct-26	Code smells, coupling and cohesion	Dario

Date	Lecture	Lecturer
Thu 5-Nov-26	S.O.L.I.D., Simple Design, Static code analysis	Dario
Mon 9-Nov-26	Introduction to design patterns, Composite pattern	Dario
Thu 12-Nov-26	Java Swing basics	Paolo
Mon 16-Nov-26	Custom components in Java Swing	Paolo
Thu 19-Nov-26	Multithreading in Java Swing	Paolo
Mon 23-Nov-26	MVC and the Humble Object pattern	Paolo
Thu 26-Nov-26	Test doubles	Paolo
Mon 30-Dec-26	GUI Testing	Paolo
Thu 3-Dec-26	Mutation testing and property-based testing	Dario
Thu 10-Dec-26	Acceptance testing	Paolo
Mon 14-Dec-26	AI-assisted tasks	Dario
Thu 17-Dec-26	AI-assisted development	Paolo



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How to reach us

MS Teams

Look here for the SOFTWARE DEVELOPMENT METHODS code

Moodle

https://moodle2.units.it/course/view.php?id=16868

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