

Object-Oriented Computer Programming with Java

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1 Course Description

This course is an introduction to object-oriented computer programming using the Java programming language. The course is targeted at beginners, and aims to furnish students with enough knowledge about object-oriented programming to be able to create simple graphical Java applications by the end of the course.

2 Course Format

One hour of lecture followed by one hour and a half of Java programming practice using the Eclipse integrated development environment.

3 Prerequisites

No prior knowledge of computer programming is required. Students will have to use their own laptop computers for the programming practice. Students must download and install on their computers:

1. the “Java SE Development Kit 8” (not the Kit 11) from www.oracle.com;
2. Eclipse from www.eclipse.org; select “Eclipse IDE for Java Developers” during the installation process.

4 Topics

1. Introduction, Java and Eclipse, classes and objects, first Java programs.
2. Instance variables, basic types, methods, basic expressions and statements, UML.
3. Static methods, testing, constructors, overloading.
4. Classes that use other classes, interfaces.
5. Inheritance, overriding.
6. Object, dynamic dispatch, subtyping polymorphism, casts.
7. Abstract methods and classes.
8. Exceptions.
9. Loops, arraylists.

10. Generics.
11. Graphics: simple input and output, frames, components, layout managers.
12. Graphics: panels.
13. Graphics: action listeners, mouse listeners, mouse motion listeners.
14. Graphics: action listeners with timers.
15. Practical test.

5 Assessment

There will be three homework assignments, each counting for 20% of the final grade, and one in-class computer-based practical test at the end of the course that will count for 40% of the final grade.

6 Course Materials

Handouts will be provided as necessary.