

Object Oriented Programming (E702050)

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0

Study time 180 h

Course offerings and teaching methods in academic year 2023-2024

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|----------------|-------|------|--------------------|
| A (semester 1) | Dutch | Gent | lecture seminar |
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Lecturers in academic year 2023-2024

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|-----------------|------|--------------------|
| Naessens, Helga | TW05 | lecturer-in-charge |
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Offered in the following programmes in 2023-2024

| | crdts | offering |
|--|--------------|-----------------|
| Bachelor of Science in Engineering Technology(main subject Electronics and ICT Engineering Technology) | 6 | A |
| Bachelor of Science in Engineering Technology(main subject Information Engineering Technology) | 6 | A |
| Linking Course Master of Science in Electronics and ICT Engineering Technology(main subject Electronics Engineering) | 6 | A |
| Linking Course Master of Science in Electronics and ICT Engineering Technology(main subject Embedded Systems) | 6 | A |
| Linking Course Master of Science in Electronics and ICT Engineering Technology(main subject ICT) | 6 | A |
| Preparatory Course Master of Science in Information Engineering Technology | 6 | A |

Teaching languages

Dutch

Keywords

Object oriented programming, Java, Computer Science (P170), Informatics (P175), Computer Technology (T120)

Position of the course

This course learns the student the principles of object oriented programming in Java. Furthermore, this course has a broad educational value: it gives insight into abstract structures and processes, it develops analytical skills, the students learn to think modularly, they learn to solve problems themselves and to formulate appropriate solutions. The acquired theoretical knowledge and skills are used in many other areas (design, planning, optimization, ...)

This course is a fundamental course for other courses in the domain of computer science.

Contents

Among other things following topics are covered:

- Basic principles of object oriented programming: classes, objects, methods, constructors, inheritance, overloading, Object, polymorphism, dynamic binding, interfaces
- Classes: organization and access, static, final, abstract
- Use of reference objects: arrays and shared structure, parameters and return values: privacy leaks, copy constructor, clone
- Exception handling
- Collections, generics, iterators
- Enumerations
- Lambda expressions and functional interfaces
- Streams

Initial competences

A good experience with some programming language (like for example Python): methods, sequence, selection, iteration, collections, ...

Final competences

- 1 Analyze, structure and translate a problem into a computer program in Java.
- 2 Apply the basic concepts of object oriented programming in Java (classes, object, methods, constructors, inheritance, overriding, overloading, Object, interfaces, polymorphism, dynamic binding, static, final, abstract, clone, collections, exception handling, IO, generics, iterators, enumerations, lambda expressions and functional interfaces, streams, ...).
- 3 Independently implement, test and execute a computer program in Java.
- 4 Convert an object oriented design to a working computer program in Java

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture

Extra information on the teaching methods

During the lectures (24hrs) the theory is explained step by step, partly based on examples.

During the exercise sessions (36hrs) the student works on his laptop.

Learning materials and price

Syllabus (Dutch) "Objectgeoriënteerd programmeren", sold by student organisation (estimated cost: 6 euro)

Slides, examples and exercises with solutions are provided on the electronic learning environment.

Some books about the course topics are available in the library.

References

Java How to Program, Early Objects, 11th Global Edition, Harvey Deitel & Paul J. Deitel, ISBN 978-1-2922-2385-8

Introduction to Java Programming and Data Structures, Comprehensive Version, Global Edition, 11/E, Y. Daniel Liang, ISBN 978-1-2922-2187-8

Core Java SE 9 for the Impatient, Cay S. Horstmann, ISBN 978-0-13-469472-6

Course content-related study coaching

The student can always make an appointment with the teacher.

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Skills test, Written assessment with open-ended questions

Examination methods in case of periodic assessment during the second examination period

Skills test, Written assessment with open-ended questions

Examination methods in case of permanent assessment

Skills test, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

PE: written exam + practical exam on PC. The written exam is a combination of exercises and theoretical questions.

NPE: the students have to make a project and there is a skills test on PC.

Calculation of the examination mark

PE (70%): written exam (40%) + practical exam on a PC (30%)

NPE (30%): skills test (25%) + project (5%)

Students who eschew one or more parts of the assessment can no longer obtain a pass mark for the course unit. Should the final mark be higher than 7/20, it will be reduced to the highest non-passable mark (i.e. 7/20).

During the second exam chance the points of the skill test of NPE disappear, those of the project are retained (5%). The remaining 95% of the points are obtained on the written exam (45%) and a practical exam on the computer (50%).

